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JOURNAL
OF THE ASSOCIATION OF
MILITARY
SURGEONS
OF THE UNITED STATES.

EDITED BY

JAMES EVELYN PILCHER, M.D., L.H.D.

MAJOR AND BRIGADE SURGEON OF UNITED STATES VOLUNTEERS;
"CAPTAIN, RETIRED, IN THE UNITED STATES ARMY.

VOLUME X.



CARLISLE, PENNSYLVANIA,
THE ASSOCIATION OF MILITARY SURGEONS.

1901-1902.



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John Kauk Hoff
Major, Surgeon U.S. Army.

PROCEEDINGS
OF
THE ASSOCIATION OF
Military Surgeons
OF
THE UNITED STATES

AT ITS TENTH ANNUAL MEETING HELD
AT SAINT PAUL, MINNESOTA
MAY 30, 31 AND JUNE 1, 1901



CARLISLE, PENNSYLVANIA
THE ASSOCIATION OF MILITARY SURGEONS
1901



Association of Military Surgeons of the United States.

ELEVENTH ANNUAL MEETING.

WASHINGTON, D. C.

JUNE 5, 6 AND 7, 1902.

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(So far as completed at date of publication.)

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Captain EDWARD L. MUNSON,
Assistant Surgeon, United States Army.

Constitution and By-Laws.

Revised June 1, 1901.

PREAMBLE.

The Military Surgeons of the United States, in order to promote and improve the science of Military Surgery, have associated themselves together and adopted the following Constitution and By-Laws:

CONSTITUTION.

ARTICLE I.

NAME.

The organization shall be known as "The Association of Military Surgeons of the United States."

ARTICLE II.

MEMBERS.

SECTION 1. There shall be Active, Associate, Honorary, Corresponding, and Life Members.

ACTIVE MEMBERS.

SECTION 2. Commissioned medical officers of the United States Army, of the Navy, of the Marine Hospital Service, of the National Guard or Volunteer Militia of the several States, of the United States Volunteers and acting assistant or contract surgeons of the United States Army, are eligible for active membership. Active members may retain their membership should they be honorably discharged from the service in which they were commissioned. Active members only shall be eligible for office or entitled to vote.

ASSOCIATE MEMBERS.

SECTION 3. Ex-medical officers and other officers of either of the above-mentioned services, and of the Marine Hospital Service, ex-medical officers of the United States Volunteer Service, and ex-medical officers of the Confederate Army and Navy, whose service was honorably terminated, are eligible for associate membership.

HONORARY MEMBERS.

SECTION 4. Persons who are not qualified for active membership, but who have achieved distinction in the military service, are eligible as honorary members.

CORRESPONDING MEMBERS.

SECTION 5. Military Surgeons living outside of the United States who are prominent in the literature of military medicine and hygiene, are eligible as corresponding members.

LIFE MEMBERS.

SECTION 6. On payment of the sum of Fifty Dollars any active member may become a life member and be exempt from further dues.

ARTICLE III.

OFFICERS AND STANDING COMMITTEES.

OFFICERS.

SECTION 1. The officers shall be a President, two Vice-Presidents, a Secretary and a Treasurer, who shall hold their respective offices until their successors are elected and qualified.

STANDING COMMITTEES.

SECTION 2. There shall be the following Standing Committees:

An Executive Committee, to consist of the officers and ex-presidents, and five (5) members.

A Publication Committee, to consist of three (3) members, one of whom shall be the Secretary as *ex-officio* Chairman.

A Literary Committee, to consist of seven (7) members,—four (4) members from the National Guard, State Troops or Militia, and one (1) each from the Army, Navy and Marine Hospital Service.

A Nominating Committee, based upon a representative or

one vote for each State, Territory, the Army, the Navy and the Marine Hospital Service, and for every additional ten (10) members or major fraction thereof an extra representative or vote; said vote or votes to be cast by a member or members, present from each State, Territory, Army, Navy and Marine Hospital Service, to be designated by the members present from each State, Territory, Army, Navy and Marine Hospital Service at the time of meeting.

ARTICLE IV.

QUORUM.

Thirty-five (35) members shall constitute a quorum for the transaction of business, but a less number may adjourn.

ARTICLE V.

AMENDMENTS.

All amendments to this Constitution and By-Laws shall be proposed in writing at one annual meeting, and voted on at the next. A three-fourths vote of all the members present at the annual meeting shall be necessary for adoption.

BY-LAWS.

ARTICLE I.

ELECTION TO MEMBERSHIP.

SECTION 1. Election to active or associate membership shall be by the Executive Committee, to whom the Secretary shall refer all applications, together with such credentials as may be presented.

SECTION 2. Election to honorary or corresponding membership shall be by a two-thirds vote of the Association, after the unanimous recommendation of the Executive Committee.

ARTICLE II.

EXPULSION FROM MEMBERSHIP.

Any member who may be dismissed from the service for conduct unbecoming an officer and a gentleman shall be expelled and debarred from any further rights or privileges when proper proof has been furnished the Secretary.

ARTICLE III.

MEETINGS.

The Association shall meet annually, the time and place to be fixed at each meeting for the one ensuing. Special meetings may be called by the President at any time. At the annual meeting the President, Vice-Presidents, Secretary and Treasurer shall be elected for the term of one year, the standing committees appointed, and the annual reports received.

ARTICLE IV.

DUES AND DELINQUENTS.

The dues to be paid by active and associate members shall be five dollars (\$5.00), due at the time of election; thereafter on January 1 of each year, in advance.

Delinquents in the payment of dues will not be entitled to the Proceedings or other publications of the Association. Delinquency for two years shall terminate membership, after due notice by the Treasurer.

No one formerly a member of the Association, who shall have allowed his membership to lapse by non-payment of dues, shall be reinstated before paying all arrears.

Honorary, Corresponding and Life members shall be exempt from the payment of dues.

ARTICLE V.

DUTIES OF OFFICERS.

THE PRESIDENT.

SECTION 1. The President shall preside at all meetings, appoint all committees, unless otherwise provided for, approve all proper bills, and perform such other duties as are usually incumbent upon such an officer.

THE VICE-PRESIDENTS.

SECTION 2. The Vice-Presidents, in order of seniority, shall perform the duties of President in the absence or inability of that officer.

THE SECRETARY.

SECTION 3. The Secretary shall keep the records and archives, issue certificates of membership to honorary and cor-

responding members on election, to active and associate members when notified by the Treasurer that the proper dues have been paid.

He shall present to the Committee on Publication a synopsis of the proceedings, and such papers as the authors desire to have published by the Association. He shall receive all applications for membership and refer the same to the Executive Committee. He shall notify the Treasurer of the election of active and associate members, and shall prepare an annual report. At each annual meeting he shall appoint an Assistant Secretary.

THE TREASURER.

SECTION 4. The Treasurer shall receive all moneys due the Association, collect all assessments, and pay all bills which have been properly approved. He shall have charge of all publications, and distribute the same to those who are entitled to them. He shall notify the Secretary when new active and associate members have paid and are entitled to certificates of membership.

The accounts of the Treasurer shall be audited by a committee appointed for that purpose on or before the annual meeting. He shall present an annual report.

He shall execute such bond of \$2,000 as may be approved by the Executive Committee for the faithful performance of his duties; the Association to bear the cost of this insurance.

ARTICLE VI.

DUTIES OF COMMITTEES.

THE EXECUTIVE COMMITTEE.

SECTION 1. The Executive Committee shall perform the duties prescribed by the Constitution and By-Laws, and such other administrative or executive duties as may be referred to it, and for which provision has not otherwise been made. The President shall be *ex-officio* chairman.

THE PUBLICATION COMMITTEE.

SECTION 2. The Publication Committee shall determine what portions of the proceedings are of sufficient general interest to be printed.

It shall also decide on the advisability of publishing the various papers presented at the annual meeting, and shall prepare for publication, contract for printing and see through the press all such papers in a volume of Annual Transactions; but all contracts for printing must first have the approval of the President and Treasurer.

THE LITERARY COMMITTEE.

SECTION 3. The Literary Committee shall outline the literary work for the annual meeting in advance, making the necessary arrangements for the reading and discussion of papers.

THE NOMINATING COMMITTEE.

SECTION 4. The Nominating Committee shall, at the annual meeting, present a list of candidates for the various offices for the ensuing year.

The vote, or votes, of the Nominating Committee shall be cast by a member, or members, who shall be designated by the members present from each State or Territory, the Army, the Navy, and the Marine Hospital Service.

Officers of the Association from Its Organization.

1891.

FIRST MEETING HELD AT **CHICAGO, ILL.**, IN THE LELAND HOTEL,
SEPT. 17-18, 1891, BRIG. GEN. NICHOLAS SENN, SURGEON
GENERAL OF WISCONSIN, PRESIDING.

1891-1892.

SECOND MEETING HELD AT **ST. LOUIS, MO.**, IN MEMORIAL HALL.
APRIL, 19, 20 AND 21, 1892.

President—Nicholas Senn, Brig. Gen. and Surg. Gen., Wis.
First Vice-President—Nelson H. Henry, Major and Surgeon, N. G. N. Y.
Second Vice-President—E. Chancellor, Lt. Col., Med. Director, N. G. Mo.
Secretary—Frederick L. Matthews, Col. and Surg. Gen., Ill. N. G.
Cor. Secretary—Ralph Chandler, Lt. and Asst. Surg., Wis. N. G.
Treasurer—Francis J. Crane, Col. and Surg. Gen., Colorado.
Chairman Committee of Arrangements for 1892—Eustathius Chancellor,
Lt. Col. and Med. Dir., N. G. Mo.

1892-1893.

THIRD MEETING HELD AT **CHICAGO, ILL.**, IN RUSH MEDICAL COLLEGE
AND THE U. S. GOVERNMENT BUILDING, WORLD'S FAIR,
AUG. 8, 9 AND 10, 1893.

President—Nicholas Senn, Col. and Surg. Gen., Ill. N. G.
Honorary President—C. R. Greenleaf, Lt. Col., Dep. Surg. Gen., U. S. A.
First Vice-President—Nelson H. Henry, Major and Surgeon, N. G. N. Y.
Second Vice-President—C. M. Woodward, Lt. Col. and Surg. Gen., Mich.
Secretary—E. Chancellor, Lt. Col. and Med. Director, N. G. Mo.
Cor. Secretary—Ralph Chandler, Lt. and Asst. Surg., Wis. N. G.
Treasurer—Francis J. Crane, Col. and Surg. Gen., Colorado.
Chairman Committee of Arrangements for 1893—Charles Adams, Major
and Surg., Ill. N. G.

1893-1894.

FOURTH MEETING HELD AT **WASHINGTON, D. C.**, IN THE NATIONAL THEATRE AND THE NATIONAL MUSEUM, MAY 1, 2 AND 3, 1894.*President*—Nicholas Senn, Colonel and Surg. Gen. N. G. Ill.*First Vice-President*—B. J. D. Jrwin, Col. and Asst. Surg. Gen. U. S. A.*Second Vice-President*—Louis W. Read, Col. and Surg. Gen., N. G. Pa.*Secretary*—E. Chancellor, Lt. Col. and Med. Director, N. G. Mo.*Treasurer*—Lawrence C. Carr, Major and Surg., Ohio N. G.*Assistant Secretary*—Julian M. Cabell, Capt. and Asst. Surg., U. S. A.*Chairman Committee of Arrangements for 1894*—George Henderson, Major and Surg. Gen. D. C. N. G.

1894-1895.

FIFTH MEETING HELD AT **BUFFALO, N. Y.**, IN THE STAR THEATRE, AND ALUMNI HALL UNIVERSITY OF BUFFALO, MAY 21, 22 AND 23, 1895.*President*—George M. Sternberg, Brig. Gen. and Surg. Gen., U. S. A.*First Vice-President*—Louis W. Read, Col. and Surg. Gen., N. G. Pa.*Second Vice-President*—Albert L. Gihon, Med. Director (Capt.), U. S. N.*Secretary*—E. Chancellor, Lt. Col. and Med. Director, N. G. Mo.*Assistant Secretary*—Julian M. Cabell, Capt. and Asst. Surg., U. S. A.*Treasurer*—Lawrence C. Carr, Major and Surg., Ohio N. G.*Chairman Committee of Arrangements for 1895*—Albert H. Briggs, Major and Surg., N. G. N. Y.

1895-1896.

SIXTH MEETING HELD AT **PHILADELPHIA, PA.**, IN THE BROAD STREET THEATRE, HOTEL WALTON, UNIVERSITY OF PENNSYLVANIA, AND UNION LEAGUE CLUB, MAY 12, 13, and 14, 1896.*President*—Louis W. Read, Col. and Surg. Gen., N. G. Pa.*First Vice-President*—Albert L. Gihon, Med. Director (Com. Ret.) U. S. N.*Second Vice-President*—Charles H. Alden, Asst. Surg. Gen., U. S. A.*Secretary*—E. Chancellor, Lt. Col. and Med. Director, N. G. Mo.*Treasurer*—Lawrence C. Carr, Major and Surg., Ohio N. G.*Editor*—Philip F. Harvey, Major and Surgeon U. S. A.*Chairman Committee of Arrangements for 1896*—J. Wilks O'Neill, Major and Surg., N. G. Pa.

1896-1897.

SEVENTH MEETING HELD AT **COLUMBUS, OHIO**, IN THE HIGH STREET
THEATRE, THE OHIO SENATE CHAMBER, STARLING MEDICAL COLLEGE
AND COLUMBUS BARRACKS, MAY 25, 26 AND 27, 1897.

President—Albert L. Gihon, Medical Director (Commodore, Ret.), U. S. N.

First Vice-President—Edward J. Forster, Brig. Gen. and Surg. Gen. M. V. M.

Second Vice President—John Van R. Hoff, Major and Surgeon U. S. A.

Secretary—Herman Burgin, Major and Surgeon, N. G. Pa.

Treasurer—James J. Erwin, Captain and Asst. Surg., Ohio N. G.

Editor—Charles C. Foster, Major and Surgeon, M. V. M.

Assistant Secretary—James Evelyn Pilcher, Capt., Asst. Surg., U. S. A.

Chairman Committee of Arrangements for 1897—Henry M. W. Moore,
Major and Surgeon, Ohio N. G.

1897-1899

EIGHTH MEETING HELD AT **KANSAS CITY, MO.**, IN CONVENTION HALL,
AND COMMERCIAL CLUB, CHAMBER OF COMMERCE BUILDING.

SEPT. 27, 28 AND 29, 1899.

President—Jefferson D. Griffith, Lt. Col. and Med. Dir., N. G. Mo.

First Vice-President—John Van Rensselaer Hoff, Maj. and Surg., U. S. A.

Second Vice-President—John C. Wise, Med. Insp. (Comdr.), U. S. N.

Secretary and Editor—James Evelyn Pilcher, Capt., Asst. Surg., U. S. A.

Treasurer—James J. Erwin, Capt. and Asst. Surg., Ohio N. G.

Assistant Secretary—W. A. Westervelt, Capt. and Asst. Surg., O. N. G.

Chairman Committee of Arrangements for 1899—Blencowe E. Fryer,
Lt. Col. and Dep. Surg. Gen. (Ret.) U. S. A.

1899-1900.

NINTH MEETING HELD AT **NEW YORK CITY**, IN THE ACADEMY OF
MEDICINE, MAY 30, 31, AND JUNE 1, 1900.

President—Charles H. Alden, Col. and Asst. Surg. Gen., U. S. A.

First Vice-President—Geo. Cook, Brig. Gen., Surg. Gen. (Ret.), N. G. N. H.

Second Vice-President—George W. Woods, Med. Director (Capt.), U. S. N.

Secretary—Charles Adams, Lt. Col. and Asst. Surg. Gen., I. N. G.

Treasurer—Herbert A. Arnold, Lt. and Asst. Surg., N. G. Pa.

Assistant Secretary—S. C. Stanton, Lt. and Asst. Surg., I. N. G.

Chairman Committee of Arrangements for 1900—Albert H. Briggs, Maj.
and Surg. N. G. S. N. Y.

1900-1901.

TENTH MEETING HELD AT **ST. PAUL, MINN.**, IN THE CHAMBER OF THE
MINNESOTA HOUSE OF REPRESENTATIVES, MAY 30 AND 31,
AND JUNE 1, 1901.

President—Alexander J. Stone, Brig. Gen. and Surg. Gen., Minn.

First Vice-President—John C. Wise, Med. Director (Capt.), U. S. N.

Second Vice-President—J. Francis Calef, Brig. Gen., Surg. Gen., Conn.

Secretary—Charles Adams, Lt. Col. and Asst. Surg. Gen., I. N. G.

Treasurer—Herbert A. Arnold, Lt. and Asst. Surg. N. G. Pa.

Assistant Secretary—S. C. Stanton, Lt. and Asst. Surg., I. N. G.

Chairman Committee of Arrangements for 1901—John F. Fulton, Brig. Gen.
and Surg. Gen. Retired, of Minnesota.



Register of Members.

REVISED TO AUGUST 15, 1901.

SIGNIFICANCE OF FIGURES.—The figures preceding each name in this list, of Life, Active, Associate, Corresponding and Honorary Members, indicate the year of election to such membership. The corresponding figures in the list of Deceased Members indicate the year of decease.

SIGNIFICANCE OF DESIGNATIONS.—The designations after the names indicate (1) the grade of Military or Naval precedence, (2) the corps title, and (3) the service, National or State, in which commissioned. A star (*) before the grade indicates that the officer is not now in active service as such.

MILITARY RANK.—In the Army and National Guard, commissioned medical officers have actual rank and are officially addressed by their military grades, their corps titles being subordinate. Contract and acting assistant surgeons have relative, not actual, rank and are addressed officially by their official designation, and socially as "Doctor."

NAVAL RANK.—In the Navy, medical officers also have actual rank, but are officially addressed by their corps titles, although in social intercourse it is customary to address them simply as "Doctor"; the titles, indicating the military grades, are therefore included in parentheses in this Register.

MARINE HOSPITAL RANK.—Officers of the marine hospital service have the same corps titles as naval medical officers, and similarly are addressed officially by the corps titles and socially as "Doctor."

VOLUNTEER RANK.—The Act of Congress, “to Increase the Efficiency of the Permanent Military Establishment of the United States,” providing that “all officers, who have served during the war with Spain or since as officers of the Regular or Volunteer Army of the United States, and have been honorably discharged from the service by resignation or otherwise, shall be entitled to bear the official title and, upon occasions of ceremony, to wear the uniform of the highest grade they have held by brevet or other commission in the Regular or Volunteer service,”—such rank has been duly inserted in this Register in connection with the names of officers entitled thereto.

CORRESPONDENCE OF MILITARY AND NAVAL GRADES.—The following table exhibits the correspondence of grades and titles in the military and naval services:

ARMY.		NAVY.	
Grades.	Titles.	Grades.	Titles.
Brig. General.	Surg. General.	Rear Admiral.	Surg. General. (Surg. Gen. and (Med. Dir. Retire .
Colonel.	Asst. Surg. General.	Commodore.	
Lieut. Colonel.	Dep. Surg. Genera .	Captain.	Med. Director.
Major.	Surgeon.	Commander.	Med. Inspector.
Captain.	Asst. Surgeon.	Lt. Commander.	Surgeon.
Ist Lieut.	Asst. Surgeon.	Lieutenant.	Surgeon.
		Lt.j.[unior]g.[rade.]	Pd. Asst. Surg.
		Ensign.	Asst. Surgeon.

In addressing communications to military commissioned medical officers both the grade and title are used; in addressing military contract surgeons, and naval and marine hospital medical officers, the latter only is employed, e. g.:

Major A***B***C***, Surgeon F***G***H***, U.S.N.

Surgeon, U. S. Army, U. S. S. I***

Fort D***, Ariz. Naples, Italy.

LIFE MEMBERS.

ELECTED.

1892	Adams, Charles, <i>Secretary, 1899-1901.</i>	Lt. Col. and Asst. Surg. Gen., I. N. G., Major and Brigade Surgeon, U. S. V., 100 State St., Chicago, Ill.
1891	Alden, Charles Henry, <i>President, 1899-1900.</i> <i>Second Vice-Prest, 1895-96</i>	Col., Asst. Surg. Gen. (Ret.), U. S. A., 33 Washington Park, Newtonville, Mass.
1891	Chancellor, Eustathius, <i>Secretary, 1892-96</i> <i>Second Vice-Prest, 1891-92.</i>	Lt. Col. and Med. Dir. (Ret.), N. G. Mo., Oriel Bldg., Sixth and Locust Sts., St. Louis, Mo.
1891	Griffith, Jefferson Davis, <i>President 1897-99.</i>	Lt. Col. and Med. Dir., N. G. Mo., Maj. and Chief Surg. U. S. V., 9th and Grand Ave., Kansas City, Mo.
1894	Pilcher, James Evelyn, <i>Secretary, 1901-02.</i> <i>Secretary and Editor, 1897-99</i> <i>Assistant Secretary, 1896-97.</i>	Major and Brigade Surgeon, U. S. V., Captain, Retired, U. S. A., 259 W. Pomfret St., Carlisle, Pennsylvania.
1891	Senn, Nicholas, <i>President, 1891-94.</i>	Col. and Surg. Gen., I. N. G., Lt. Col. and Chief Surg., U. S. V., 532 Dearborn Ave., Chicago, Ill.
1899	Wesley, Allen A., ..	Maj. and Surg. Ill. V. I., Capt. and Asst. Surg., I. N. G., 3102 State St., Chicago, Ill.

ACTIVE MEMBERS.

ELECTED.

1894.	Abbe, Edward Harper,	Lt. (j.g.) and Asst. Surg., N. B., M. V. M., 405 County St., New Bedford, Mass.
1895	Adair, George William,	Maj. and Surg., U. S. A., Manila, P. I.
1891	Adams, Charles Francis,	Maj. and Surg., N. J. V. I., Capt. and Asst. Surg., N. G., N. J., 229 Union St., Hackensack, N. J.
1898	Allen, Arthur West,	Maj. and Surg. N. G., Minn., Austin, Minn.
1900	Allers, Henry,	Maj. and Surg. N. G., N. J., Maj. and Surg. N. J. V. I., 300 Davis Ave., Harrison, N. J.
1891	Almy, Leonard Ballou,	Lt. Col. and Med. Dir. (Ret.), C. N. G., Maj. and Chief Surg., U. S. V., 173 Washington St., Norwich, Conn.
1895	Altree, George Herbert,	Act. Asst. Surg., U. S. M. H. S., Port Tampa, Fla.
1899	Ames, Azel,	Maj. and Brig. Surg., U. S. V., Wakefield, Mass.
1894	Ames, Howard Emerson,	Surg. (Lt. Comdr.), U. S. N., Care Navy Dept., Washington, D. C

ELECTED.

1894	Anderson, Frank,	Surg. (Lt. Comdr.), U. S. N., Naval Dispensary, Washington, D. C.
1901	Anderson, Winslow,	Col. and Surg. Gen. of California, 1025 Sutter St., San Francisco, Cal.
1900	Angney, William Muir,	1st Lt. and Asst. Surg., N. G. Pa., 423 S. 15th St., Philadelphia, Pa.
1893	Anthony, Frank,	Maj. and Surg. I. N. G., Maj. and Surg., Ill. V. I., First Ave., Sterling, Ill.
1893	Appel, Daniel Mitchell,	Maj. and Surg., U. S. A., Fort Bayard, New Mexico.
1896	Archibald, O. Wellington,	Col. and Surg. Gen., N. D. N. G., Jamestown, N. D.
1895	Arnold, Herbert Alonzo, <i>Treasurer 1899-1902.</i>	1st Lt. and Asst. Surg., N. G. Pa. 1st Lt. and Asst. Surg., Pa. V. C., Ardmore, Pa.
1896	Arnold, Will Ford,	Surg. (Lt.), U. S. N., Care Navy Dept., Washington, D. C.
1898	Artaud, Frank Edward,	Maj. and Surg. U. S. V., Manila, P. I.
1895	Ashenfelter, William J.,	Maj. and Surg. N. G. Pa., Maj. and Surg., Pa. V. I., Pottstown, Pa.
1897	Ashley, Maurice Cavileer,	1st Lt. and Asst. Surg., N. G. N. Y., 1st Lt. and Asst. Surg., N. Y. V. I., Middletown, N. Y.
1897	Ashmun, George C.,	Maj. and Surg. O.N.G., 94 Republic St., Cleveland, O.
1897	Austin, Charles Sterne,	Maj. and Surg. N.G.Mo., Carrollton, Mo.
1900	Austin, Hiram William,	Surg. U.S.M.H.S. 410 Chestnut St., Philadelphia, Pa.
1894	Bache, Dallas,	Col. and Asst. Surg. Gen., U.S.A., Surg. Gen. Office, Washington, D. C.
1895	Baker, John Walter,	Surg. (Lt. Ret.), U.S.N., Aurora, Ind.
1892	Baker, Washington Hopkins,	Maj. and Surg. (Ret.), N.G.Pa., 1610 Sumner St., Philadelphia, Pa.
1894	Balch, Lewis,	Maj. and Brigade Surg., U.S.V., Maj. and Surg., N.G.N.Y., 14 Washington Ave., Albany, N. Y.
1896	Banister, John Monroe,	Maj. and Surg., U.S.A., West Point, N. Y.
1895	Barber, George Holcomb,	Surg. (Lt.), U.S.N. Care Navy Dept., Washington, D. C.
1892	Barker, Christopher F.,	Maj. and Surg., R.I.M., 32 Bull St., Newport, R. I.
1892	Barnes, Algernon S.,	Brig. Gen., Surg. Gen. (Ret.), N.G.Mo., 5434 Maple Ave., St. Louis, Mo.

ELECTED.

1898	Barney, Reuben, Jr.,	Capt. and Asst. Surg., N.G.Mo., Chillicothe, Mo.
1900	Barns, Cass Grove,	Col. and Surg. Gen., N.G.,Neb., Albion, Neb.
1897	Barry, William Francis,	1st Lt. and Asst. Surg., R.I.M., Woonsocket, R. I.
1899	Barstow, James Mason,	Lt. Col. and Dep. Surg. Gen. N.G.Ia., Council Bluffs, Ia.
1894	Battle, Samuel Westray,	Maj. and Asst. Surg. Gen., N.C., P. A. Surg. (Lt. j. g., Ret.), U.S.N., Asheville, N. C.
1894	Bayles, George,	Ex-Maj., Surg. N.Y.V.H.A.(Civil War), 408 Main St., Orange, N. J.
1896	Belcher, William Nathan,	Capt. and Asst. Surg. N.G.N.Y., 25 Portland Ave., Brooklyn, N. Y.
1895	Bell, Robert Eddy,	2d Lt. Amb. Corps, M.V.M., Lowell, Mass.
1893	Benedict, John Mitchell,	Ex-Maj. and Surg., Conn. N.G., 81 N. Main St., Waterbury, Conn.
1901	Bentley, Edwin,	Maj. and Surg. (Ret.), U.S.A., Little Rock, Ark.
1898	Benton, Frederick Leslie,	Asst. Surg. (Lt. j. g.), U.S.N., Care Navy Dept., Washington, D. C.
1900	Berkley, George Carlton,	Maj. and Surg., N.G.Vt., 130 Main St., St. Albans, Vt.
1893	Bertolette, Daniel Nicholas,	Medical Inspector (Comdr.), U.S.N., Care Navy Dept., Washington, D. C.
1895	Beyer, Henry Gustav,	Surg. (Lt. Comdr.), U.S.N., Care Navy Dept., Washington, D. C.
1895	Birmingham, Henry P.,	Maj. and Surg., U.S.A., Maj. and Brig. Surg., U.S.V., Manila, P. I.
1894	Blackwood, Norman Jerome,	P. A. Surg., (Lt.), U.S.N., Care Navy Dept., Washington, D. C.
1900	Blakeman, Robert Sylvester,	P. A. Surg. (Lt. j. g.), U.S.N., Care Navy Dept., Washington, D. C.
1901	Block, William H.,	Capt. and Asst. Surg., U.S.A., Medical Supply Depot, Havana, Cuba.
1895	Blood, Robert Allen,	Brig. Gen. and Surg. Gen., M.V.M., 39 High St., Charlestown, Mass.
1901	Bloodgood, Delavan,	Med. Dir. (Capt. Ret.), U.S.N., 320 Clermont Ave., Brooklyn, N. Y.
1897	Blubaugh, Charles B.,	Lt. Col. and Med. Dir., W. Va. N.G., 1010 Murdock Ave., Parkersburg, W. Va.
1900	Bogart, Arthur Henry,	Maj. and Surg. N.Y.V.I.
1895	Borden, William Cline,	Capt. and Asst. Surg., N.G.N.Y., 139 Seventh Ave., Brooklyn, N. Y.
1894	Boyd, John C.,	Maj. and Surg. U.S.A., Maj. and Brig. Surg., U.S.V., Washington Barracks, D. C.
		Medical Inspector (Comdr.) U.S.N. Care Navy Dept., Washington, D. C.

ELECTED.

1895	Boyd, Robert,	Capt. and Asst. Surg., U.S.V., Manila, P. I.
1891	Bradbury, Bial Francisco,	Maj. and Brig. Surg., U.S.V., Maj. and Surg., Me.V.M., Norway, Me.
1896	Bradley, Alfred E.,	Maj. and Brig. Surg., U.S.V., Capt. and Asst. Surg., U.S.A., Fort Snelling, Minn.
1895	Bradley, George Perley,	Medical Director, (Captain,) U.S.N., Washington, D. C.
1891	Brannen, Dennis J.,	Capt. and Asst. Surg., N. G., Ariz., Flagstaff, Ariz.
1892	Briggs, Albert Henry,	Maj. and Surg., N.G.N.Y., Maj. and Surg., N.Y.V.I., 267 Hudson St., Buffalo, N. Y.
1898	Brodrick, Richard Godfrey,	P. A. Surg. (Lt. j.g. Ret.), U.S.N., 1037 Fifth Ave., New York, N. Y.
1900	Brokaw, William F.,	Lt. and Surg., N.B.O.N.G., 1040 Wilson Ave., Cleveland, Ohio.
1897	Brooke, John,	Maj. and Surg. (Ret.), U.S.A., Radnor, Pa.
1900	Brooks, Harlow,	Capt. and Asst. Surg., N.G.N.Y., 7th Regt. Armory, New York, N. Y.
1894	Brown, Orland J.,	Maj. and Surg., M.V.M., North Adams, Mass.
1900	Brownell, Carl DeWolf,	P. A. Surg., (Lt.) U.S.N., Care Navy Dept., Washington, D. C.
1895	Brubaker, John L.,	1st Lt. and Asst. Surg., N.G., Pa., 1224 4th Ave., Altoona, Pa.
1898	Bruce, Charles E.,	Maj. and Surg. (Ret.), N.G.N.Y., 176th St., and Amsterdam Ave., New York, N. Y.
1898	Brugman, Albert Ferdinand,	Capt. and Asst. Surg., N.Y.V.I., 1st Lt. and Asst. Surg., N.G.N.Y., Hotel Endicott, New York, N. Y.
1895	Brush, Edmund Cone,	Brig. Gen. and Surg. Gen., O.N.G., Zanesville, O.
1891	Bryant, Joseph Decatur,	Brig. Gen., Surg. Gen. (Ret.) N.G.N.Y., 54 W. 36th St., New York, N. Y.
1893	Budlong, John Clark,	Brig. Gen., Surg. Gen. (Ret.), R.I.M., 604 Westminster St., Providence, R. I.
1895	Bunts, Frank Emory,	Maj. and Surg. O.V.C.
1900	Burbank, Thomas Sparrow,	Capt. and Asst. Surg., O.N.G., 275 Prospect St., Cleveland, O.
1896	Burgin, Herman, <i>Secretary, 1896-97.</i>	Lt. and Surg., N.R., N.G.N.C., Wilmington, N. C.
1895	Byrne, Charles C.,	Maj. and Surg., N.G. Pa., Maj. and Surg. Pa.V.I., Germantown, Pa.
		Col. and Asst. Surg. Gen. (Ret.), U.S.A., Care Surg. Gen., Washington, D. C.

ELECTED.

1899	Calef, J. Francis, <i>Second Vice-Pres., 1900-1901.</i>	Brig. Gen. and Surg. Gen., C.N.G., Middletown, Conn.
1897	Campbell, William Francis,	1st Lt. and Asst. Surg., N.G.N.Y., 127 Lafayette Ave., Brooklyn, N. Y.
1897	Carpenter, Dudley Newcomb,	P. A. Surg. (Lt. j. g.) U.S.N., Care Navy Dept., Washington, D. C.
1899	Carr, E. Arthur,	Maj. and Surg., Neb. N.G., 1205 O St., Lincoln, Neb.
1893	Carr, George Wheaton,	Lt. Col. and Med. Dir. (Ret.), R.I.M., 27 Waterman St., Providence, R. I.
1894	Carrington, Charles Venable,	Capt. and Asst. Surg., Va. Vols., 932 Park Ave., Richmond, Va.
1897	Carter, Edward Champe,	Maj. and Surg., U.S.A.,
1893	Cassidy, Patrick,	Maj. and Brigade Surg. U.S.V., 1814 G St. N. W., Washington, D. C.
1895	Castle, Charles Henry	Ex-Brig. Gen., and Surg. Gen., C.N.G., Norwich, Conn.
1895	Cawley, Morris Franklin	Capt. and Asst. Surg., O.N.G.,
1891	Chandler, Ralph, <i>Cor. Sec., 1891-93.</i>	Capt. and Asst. Surg., O.V.I., 215 W. 9th St., Cincinnati, O.
1892	Clark, Thomas Chalmers,	1st Lt. and Asst. Surg., N.G.Pa., 31 N. 9th St., Allentown, Pa.
1897	Clark, Joseph Taylor,	Capt. and Asst. Surg. Wis.N.G., 13 Grand Ave., Milwaukee, Wis.
1901	Coffin, John William,	Maj. and Surg., N.G., Minn.,
1898	Cogswell, William,	Maj. and Surg., Minn.V.I., Stillwater, Minn.
1900	Colby, Charles DeWitt,	Maj. and Surg., U.S.V.,
1893	Cole, Charles M.,	Capt. and Asst. Surg., U.S.A., Care War Dept., Washington, D. C.
1895	Cook, Charles P.,	Capt. and Asst. Surg., N.G.P., Beaver Falls, Pa.
1898	Cook, Frank Clarendon,	Maj. and Surg., M.V.M.,
1893	Cook, George, <i>First Vice-President, 1899-1900</i>	Maj. and Surg., Mass.V.I., 241 Boylston St., Boston, Mass.
1899	Coon, George M.,	Maj. and Surg., Mich.V.I., Capt. and Asst. Surg., Mich.S.T., Albion, Mich.
1894	Corwin, Richard Warren,	1st Lt. and Asst. Surg., R.I.M., 250 Broadway, Newport R. I.
		Col. and Asst. Surg. Gen., N.G.N.Y., 243 Warren St., Hudson, N. Y.
		P. A. Surg., (Lt.), U.S.N., Care Navy Dept., Washington, D. C.
		Brig. Gen., Surg. Gen. (Ret.), N.G.N.H.,
		Maj. and Chief Surg., U.S.V., 16 Centre St., Concord, N. H.
		1st Lt. and Asst. Surg. Minn.N.G., 110 Lowry Arcade, St. Paul, Minn.
		Col. and Asst. Surg. Gen., N. G., Colo., Pueblo, Colo.

ELECTED.

1895	Cowell, George B.,	1st Lt. and Asst. Surg., Conn. N.G. 120 E. Washington Ave., Bridgeport, Conn
1895	Crandall, Rand Percy,	Surg. (Lt.), U.S.N., Care Navy Dépt., Washington, D. C.
1894	Crispel, Charles Winegar,	1st Lt. and Asst. Surg., N.G.S.N.Y., Rondout, N. Y.
1901	Cronyn, William J.,	Capt. and Asst. Surg. W.N.G., 245 14th St., Milwaukee, Wis.
1897	Crooker, George Hazard,	Ex-Capt. and Asst. Surg., R.I.M., 159½ Benefit St., Providence, R. I.
1894	Currier, Edward Hervey,	Lt. Col. and Med. Dir., N.H.N.G., 728 Elm St., Manchester, N. H.
1898	Czibulka, Alfons Clemens,	1st Lt. and Asst. Surg., I.N.G., Warren, Ill.
1901	Davis, John S.	1st Lt. and Asst. Surg. I.N.G., 9139 Commercial Ave., Chicago, Ill.
1895	Dawson, Lewis Reeves,	Lt. Col. and Brig. Surg., N.G., Wash., Maj. and Surg., Wash. V.I., Box 249, Seattle, Wash.
1895	Day, Frank Leslie,	Maj. and Surg., R.I.M., 240 Benefit St., Providence, R. I.
1894	Dearing, Howard Sumner,	Maj. and Surg., M.V.M., Maj. and Surg., Mass. V.H.A., 607 Tremont St., Boston, Mass.
1898	de Forest, Henry Pelouze,	Maj. and Surg., N.G.N.Y., Ex-Acting Assistant Surg., U. S. A., 369 Hancock St., Brooklyn, N. Y.
1891	de Niedman, Wladimir Feodor,	Maj. and Surg., U.S.V., Manila, P. I.
1895	Derr, Ezra Z.,	Medical Inspector, (Comdr.), U.S.N., Care Navy Dept., Washington, D. C.
1894	Devine, William H.,	Lt. Col. and Med. Dir., M.V.M., Maj. and Chief Surg., U.S.V., 595 Broadway, South Boston, Mass.
1897	Dickerson, John Henry,	Capt. and Asst. Surg., O.N.G., Capt. and Asst. Surg., O.V.I., 225 N. Champion Ave., Columbus, O.
1897	Dickson, Samuel Henry,	Surg. (Lt. Comdr.), U.S.N., Care Navy Dept., Washington, D. C.
1899	Dillenbeck, Fred E.,	Capt. and Asst. Surg. N.G.Kan., El Dorado, Kan.
1895	Dixon, Charles Henry,	Maj. and Surg., N.G.Mo., 3345 Morgan St., St. Louis, Mo.
1901	Dorsey, John H.	1st Lt. and Asst. Surg., Minn.N.G., Glencoe., Minn.
1898	Dougherty, Arthur C.	2d Lt. and Asst. Surg., N.G.N.J., 158 Washington St., Newark, N. J.
1901	Drake, Clarence Eugene,	Maj. and Surg., O.N.G., 324 Putnam Ave., Zanesville, Ohio.
1900	Drumheller, Francis E.,	1st Lt. and Asst. Surg., N.G.Pa., Sunbury, Pa.

ELECTED.

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|------|--|---|
| 1893 | Dutton, Charles Elvan, | Capt. and Asst. Surg., Minn.V.I.,
1st Lt. and Asst. Surg., N.G.Minn.,
602 Nicollet Ave., Minneapolis, Minn. |
| 1893 | Eagleson, James Beaty, | Col. and Surg. Gen., N.G.Wash.,
512 Burke Bldg., Seattle, Wash. |
| 1894 | Edie, Guy L., | Maj. and Surg., U.S.A.,
Maj. and Brigade Surg., U.S.V.,
Care War Dept., Washington, D. C. |
| 1891 | Edwards, John B., | Brig. Gen. and Surg. Gen., Wis. N.G.,
Mauston, Wis. |
| 1900 | Elliott, Gilbert M., | 1st Lt. and Asst. Surg., Me.V.M.,
Brunswick, Me. |
| 1895 | Emmerling, Karl A., | 1st Lt. and Asst. Surg., N.G. Pa.,
1st Lt. and Asst. Surg., Pa. V.I.,
48 S Rebecca St., Pittsburg, Pa. |
| 1895 | Erwin, James Jay,
<i>Treasurer, 1896-99.</i> | Capt. and Asst. Surg., U.S.V.,
Capt. and Asst. Surg., O.N.G.,
1617 Cedar Ave., Cleveland, O. |
| 1901 | Evans, Carroll D. | Col. and Surg. Gen., Nebraska,
Columbus, Neb. |
| 1891 | Evans, Theodore W., | Maj. and Surg., Wis. N.G.,
Maj. and Surg., Wis. V.I.,
3 Pinckney St., Madison, Wis. |
| 1901 | Fairchild, David S., | Maj. and Surg., N.G. Ia.,
Clinton, Iowa. |
| 1897 | Fales, Warren Dexter, | 1st Lt. Cmdg. Amb. Corps, N.G.D.C.
915 L St., N. W., Washington, D. C. |
| 1898 | Farenholt, Ammen, | P. A. Surg. (Lt.), U.S.N.,
Care Navy Dept., Washington, D. C. |
| 1896 | Farrell, Patricinne J. H., | Capt. and Asst. Surg., N.G.Cal.,
135 Geary St., San Francisco, Cal. |
| 1891 | Festorazzi, Angelo, | Ex-1st Lt. and Asst. Surg., S.T.Ala.,
153 Government St., Mobile Ala. |
| 1897 | Fish, Earl Hamilton, | 1st Lt. and Asst. Surg., N.G.Colo.,
2535 Champa St., Denver, Colo. |
| 1892 | Fitz Gerald, Reynaldo Juan, | Lt. Col. and Med. Dir., N.G.Minn.,
Maj. and Surg., Minn.V.I.,
128 S. Fifth St., Minneapolis, Minn. |
| 1897 | Flagg, Charles Edward Belin, | Capt. and Asst. Surg., U.S.A.,
Care Surg. Gen., Washington, D. C. |
| 1901 | Ford, Francis C., | Lt. Col. and Med. Dir., Tex. V. G.,
Maj. and Brig. Surg., U. S. V.,
Nacogdoches, Tex. |
| 1893 | Forwood, William Henry, | Col. and Asst. Surg. Gen., U.S.A.,
Washington, D. C. |
| 1894 | Foster, Charles, Chauncey,
<i>Editor 1896-97.</i> | Maj. and Surg., M.V.M.,
Maj. and Surg., Mass.V.I.,
8 Elmwood Ave., Cambridge Mass. |
| 1892 | Foster, Romulus Adams, | 1st Lt. and Asst. Surg., N.G.D.C
2029 Q St. N. W., Washington, D. C. |

ELECTED.

1893	Fowler, George Ryerson,	Lt. Col. and Brig. Surg., N.G.N.Y., Maj. and Chief Surg., U.S.V., 301 DeKalb Ave., Brooklyn, N. Y.
1893	French, Charles Henry,	Lt. Col. and Med. Dir., R.I.M., 109 Broadway, Pawtucket, R. I.
1897	Frick, Euclid Bernardo,	Capt. and Asst. Surg., U. S. A., San Juan, P. R.
1897	Fryer, Blencowe E.,	Lt. Col., Dep. Surg. Gen. (Ret.) U.S.A., 520 E. 9th St., Kansas City, Mo.
1891	Fuller, Charles Gordon,	Maj and Surg., I.N.G., 100 State St., Chicago, Ill.
1895	Gandy, Charles Moore,	Maj. and Surg., U.S.A., Maj. and Chief Surg., U.S.V., Manila, P. I.
1894	Gardner, Edwin Fisher,	Maj. and Surg., U.S.A., Manila, P. I.
1895	Gates, Manley Fitch,	P. A. Surg. (Lt. j. g.), U.S.N., Naval Hospital, Norfolk, Va.
1900	Geer, Edward,	Lt. and Surg. N.R.N.G.Md., 1614 Bolton St., Baltimore, Md.
1900	Gettier, Harry Ernshaw,	Ex-Act. Asst. Surg., U. S. A., Littlestown, Pa.
1897	Gibson, Robert Jackson,	Maj, and Surg., U.S.A., San Francisco, Cal.
1893	Girard, Alfred C.,	Lt. Col., and Dep. Surg., Gen., U.S.A., Lt. Col. and Chief Surg., U.S.V., San Francisco, Cal.
1894	Glennan, James D.,	Maj. and Brig. Surg., U.S.V., Capt. and Asst. Surg., U.S.A., Care Surg. Gen., Washington, D. C.
1896	Glover, Lawrence Ritchfield,	Ensign and Asst. Surg., N. R., N.G.N.J., Haddonfield, N. J.
1892	Godfrey, Charles Cartlidge,	Ex-Maj. and Surg., C. N. G., 242 State St., Bridgeport, Conn.
1892	Godfrey, E. L. B.,	Col. and Asst. Surg. Gen., N.G.N.J., 400 Linden St., Camden, N. J.
1894	Godfrey, Guy Charles Moore,	Capt. and Asst. Surg., U.S.A., Manila, P. I.
1899	Goodrich, Asa F.,	1st Lt. and Asst. Surg., N.G. Minn., Germania Bldg., St. Paul, Minn.
1897	Gotwald, David King,	Capt. and Asst. Surg., O.N.G., Capt. and Asst. Surg., O.V.I., Springfield, O.
1891	Grannis, Edward H.,	Maj, and Surg., Wis. N. G., 1st Lt and Asst. Surg., Wis. V. I., Menominee, Wis.
1894	Grant, Thomas Page,	Capt. and Asst. Surg. (Ret.) K.S.G., 815 Third Ave., Louisville, Ky.
1899	Grant, William West,	Col. and Surg. Gen., of Colorado, Denver, Colo.

ELECTED.

- 1894 Green, Charles Montraville,
 1896 Greene, Francis V.,
 1899 Grothan, Ole,
 1898 Grunwell, Alfred Gilbert,
 1897 Guerin, Lovett T.,
 1897 Gunsaulus, Fred.,
 1897 Guest, Middleton Semmes,
 1896 Guthrie, Joseph Alfred,
 1892 Hake, William F.,
 1892 Halberstadt, George Howell,
 1891 Halley, George,
 1900 Hamilton, John,
 1898 Hammond, Josiah Shaw,
 1896 Hanson, George F.,
 1901 Harmer, Joseph Randolph,
 1899 Harrelson, Nathan O.,
 1895 Harris, Henry Sutton Tarring,
 1901 Harris, Herbert L.,
 1894 Harvey, Norman Darrell,
 1894 Harvey, Philip Francis,
Editor 1895-96.
 1893 Havard, Valery,
 1898 Hayes, Robert Goodloe Harper,
 1896 Heizmann, Charles Lawrence,
- Maj. and Surg., M.V.M.,
 78 Marlborough St., Boston, Mass.
 P. A. Surg. (Lt. Ret.), U.S.N.,
 33 S. 19th St., Philadelphia, Pa.
 Maj. and Surg., Neb.V.I.,
 St. Paul, Neb.
 P. A. Surg. (Lt. j.g.), U.S.N.,
 Care Navy Dept., Washington, D. C.
 Maj. and Surg., O.N.G.,
 578 N. High St., Columbus, O.
 Capt. and Asst. Surg., O.N.G.,
 29 W. Long St., Columbus, O.
 P. A. Surg. (Lt.), U.S.N.,
 Care Navy Dept., Washington, D. C.
 P. A. Surg. (Lt.), U.S.N.,
 Care Navy Dept., Washington, D. C.
 Maj. and Surg., M.S.T.,
 47 E. Bridge St., Grand Rapids, Mich.
 Maj. and Surg., N.G.Pa.,
 218 Market St., Pottsville, Pa.
 Maj. and Surg., N.G.Mo.,
 438 New Ridge Bldg., Kansas City, Mo.
 1st Lt. and Asst. Surg. (Ret.), N.G.I.,
 1st Lt. and Asst. Surg., Iowa V.I.,
 Cedar Rapids, Iowa.
 Maj. and Surg., N.G. Mont.,
 Butte, Mont.
 Lt. Col. and Med. Dir., N.G.Cal.,
 3534 Mission St., San Francisco, Cal.
 Contract Surgeon, U.S.A.,
 Fort Fremont, via Beaufort, S. C.
 Maj. and Surg., U.S.V.,
 517 Rialto Bldg., Kansas City, Mo.
 Maj. and Surg., U.S.A.,
 Maj. and Brig. Surg., U.S.V.,
 Manila, P. I.
 Contract Surg., U.S.A.,
 Fort Snelling, Minn.
 Maj. and Surg., R. I. M.,
 1st Lt. and Asst. Surg., R. I. V. I.,
 260 Benefit St., Providence, R. I.
 Lt. Col. and Dep. Surg. Gen., U.S.A.,
 Lt. Col. and Chief Surg., U.S.V.,
 Manila, P. I.
 Lt. Col. and Chief Surg., U.S.V.,
 Maj. and Surg., U.S.A.,
 Havana, Cuba.
 1st Lt. and Asst. Surg., U.S.V.,
 11 Spring St., Bellefonte, Pa.
 Lt. Col. and Dep. Surg. Gen., U.S.A.,
 Manila, P. I.

ELECTED.

1892	Hendley, Frank W.,	Maj. and Surg., O.N.G., Maj. and Surg., O.V.I., 785 E. McMillan St., Cincinnati, O.
1891	Hendry, William,	Capt. and Asst. Surg., O.N.G., 1327 Cedar Av., Cleveland, Ohio.
1891	Henry, Nelson H., <i>First Vice-President, 1891-93.</i>	Col. and Asst. Surg. Gen., N.G.N.Y., Maj. and Chief Surg., U.S.V., 14 E. 10th St. New York, N. Y.
1896	Hersey, Freeman Clark,	Lt. Col. and Med. Dir., M. V. M., 96 Huntington Ave., Boston, Mass.
1897	Hobbs, Wilbert A.,	Maj. and Surg., O.V.I., Capt. and Asst. Surg., O.N.G., East Liverpool, O.
1891	Hoff, John Van Rensselaer, <i>President, 1901-1902.</i> <i>First Vice-President, 1897-99.</i> <i>Second Vice-President, 1896-97.</i>	Lt. Col. and Chief Surg., U.S.V., Maj. and Surg., U.S.A., Surgeon General's Office, Washington, D.C.
1896	Hoffman, John Raymond,	Capt. and Asst. Surg., I.N.G., 63 Wabash Ave., Chicago, Ill.
1893	Hooper, Henry,	Ex-Capt. and Asst. Surg., I.N.G., 541 N. State St., Chicago, Ill.
1896	Hopkins, William Evelyn,	Ex-Col. and Surg. Gen., N.G. Cal., 803 Sutter St., San Francisco, Cal.
1892	Hough, Charles Pinckney,	Ex-Brig. Gen. and Surg. Gen., N.G. Mont., 415 Atlas Blk., Salt Lake City, Utah,
1895	Howard Deane Childs,	Capt. and Asst. Surg., U.S.A., Havana, Cuba.
1897	Huddleston, John Henry,	Capt. and Asst. Surg., N.G.N.Y., 126 W. 85th St., New York, N. Y.
1899	Huidekoper, Rush Shippen,	Lt. Col. and Chief Surg., U.S.V., Army and Navy Club, 16 W. 31st St., New York, N. Y.
1899	Hunter, Randall R.,	Major and Brig. Surg., U.S.V., Fulton, Kans.
1899	Hutchings, Robert Koehler,	1st Lt. and Asst. Surg., N. G. Colo., Colorado Springs, Colo.
1896	Hyde, James Nevins,	Lt. N. R. Ill., Ex-P. A. Surg., U.S.N., 100 State St., Chicago, Ill.
1900	Iglehart, James Davidson,	Capt. and Asst. Surg., N. G. Md., 211 W. Lanvale St., Baltimore, Md.
1894	Ives, Francis Joseph,	Maj. and Surg., U.S.A., Maj. and Brig. Surg., U.S.V., Fort Sheridan, Ill.
1894	Izlar, Roberts Poinsett,	Maj. and Surg., Fla. V.I., 1st Lt. and Surg., S.T.Fla., Waycross, Ga.
1899	Jackson, Charles Warren	1st Lt. and Asst. Surg., N.G.N.Y., 130 W. 81st St., New York, N. Y.
1894	Jackson, Jabez North,	Maj. and Brig. Surg., U.S.V., Capt. and Asst. Surg., N. G., Mo., 413 Rialto Bldg., Kansas City, Mo.

ELECTED.

- 1901 Jacoby, William,
 1892 Jarrett, Arthur R.,
 1895 Jarvis, Nathan Sturges,
 1897 Jenne, James N.,
 1894 Johnston, James,
 1895 Johnston, William McCandless,
 1899 Jones, George H.,
 1897 Jordan, Charles Simonton,
 1892 Kaufman, Franklin John,
 1896 Kean, Jefferson Randolph,
 1899 Keller, James McDonald,
 1897 Kemble, Lewis Hasbrouck,
 1898 Kemp, Franklin M.,
 1898 Kendall, Francis Drake,
 1897 Kendall, William Pratt,
 1897 Kennedy, Robert Morris,
 1895 Kenyon, George Henry,
 1895 Kilbourne, Henry Sales,
 1895 Kimball, James P.
 1901 King, Charles F.,
- Maj. and Surg., Minn.N.G.,
 Wells, Minn.
 Capt. and Asst. Surg., N.G.N.Y.
 Capt. and Asst. Surg., N.Y.V.I.,
 95 Halsey St., Brooklyn, N. Y.
 Lt. Col., Asst. Surg. Gen., N.G.N.Y.,
 Maj. and Brig. Surg., U.S.V.,
 Capt. (Ret.) U.S.A.,
 142 Madison Ave., New York, N. Y.
 Brig. Gen. and Surg. Gen., Vermont,
 Maj and Chief Surg., U.S.V.,
 130 Main St, St. Albans, Vt.
 Maj. and Surg., N.G.Pa.,
 Maj. and Surg., Pa.V.I.,
 Bradford, Pa.
 Maj. and Surg., N.G.Pa.,
 Sewickley, Pa.
 1st Lt. and Asst. Surg., Ohio V.I.,
 2304 Franklin Ave., Toledo, O.
 Capt. and Asst. Surg., S.G.N.C.,
 Capt. and Asst. Surg., N.C.V.I.,
 Asheville, N. C.
 1st Lt. and Asst. Surg., N.G.N.Y.,
 311 W. Genesee St., Syracuse, N. Y.
 Lt. Col. and Chief Surg., U.S.V.,
 Maj. and Surg., U.S.A.,
 Havana, Cuba.
 Col. and Surg. Gen., Ark.N.G.,
 Hot Springs, Ark.
 Maj. and Surg., N. G., Colo.,
 Maj. and Surg., Colo. V.I.,
 Aspen, Colo.
 1st Lt. and Asst. Surg., U. S. A.,
 Manila, P. I.
 Maj. and Surg., S.C.V.T.,
 1309 Plain St., Columbia, S. C.
 Maj. and Surg., U.S.A.,
 Major and Brig. Surgeon., U.S.V.,
 Manila, P. I.
 Surg. (Lt.), U.S.N.,
 Care Navy Dept., Washington, D. C.
 Brig. Gen. and Surg. Gen., R.I.M.,
 123 N. Main St., Providence, R. I.
 Maj. and Surg., U.S.A.,
 Presidio, San Francisco, Cal.
 Lt. Col. and Dept. Surg. Gen., U.S.A.,
 Omaha, Neb.
 Capt. and Asst. Surg., Wis. N.G.
 Hudson, Wisconsin.

ELECTED.

- 1893 Kingston, Robert J.,
 1895 Kneedler, William L.,
 1896 Kulp, John Stewart,
 1896 Kuyk, Dirk Adrian,
 1891 La Garde, Louis A.,
 1893 La Pierre, Julian,
 1896 Leach, Philip,
 1898 Ledeboer, Francois S.,
 1895 Lee, Edward Wallace,
 1900 Lee, George Bolling,
 1893 Lee, Simeon Lemuel,
 1900 Le Seure, Oscar,
 1901 Lippincott, Albert Church
 1894 Lippincott, Henry,
 1898 Lippitt, William Fontaine,
 1891 Little, Frederick H.,
 1897 Lowes, Joseph E.,
 1896 Lowndes, Chas. Henry Tilghman, P. A. urg. (Lt.), U.S.N.,
 1901 Lyster, Theodore Charles,
 1900 Mac Evitt, John Cowell,
 1895 McCandless, Alexander A. E.,
 1895 McCarthy, William Daniel,
- 1st Lt. and Asst. Surg., N.G.N.Y.,
 185 Grand St., Newburgh, N. Y.
 Maj. and Surg., U.S.A.,
 Maj. and Brig. Surg., U.S.V.,
 West Point, N. Y.
 Maj. and Surg., U.S.V.,
 Capt. and Asst. Surg., U.S.A.,
 Army Building, New York, N. Y.
 Maj. and Surg., Va. V.,
 4 W. Grace St., Richmond, Va.
 Maj. and Surg. U.S.A.,
 Soldier's Home, Washington, D. C.
 Maj. and Surg., Conn.N.G.,
 Maj. and Surg., Conn.V.,
 220 Central Ave., Norwich, Conn.
 Surg. (Lt.), U.S.N.,
 Care Navy Dept., Washington, D. C.
 1st Lt. and Asst. Surg., N.G.S.D.,
 Spearfish, S. Dak.
 Col. and Surg. Gen., Nebraska,
 St. Louis, Mo.
 Ex-Act. Asst. Surg. U.S.A.,
 215 W. 43d St., New York, N. Y.
 Col and Surg. Gen., Nevada,
 Carson, Nev.
 Maj. and Engr. Surg., U.S.V.,
 32 Adams Av., Detroit, Mich.
 Col. and Surg. Gen. of Idaho,
 144 W. 103d St., New York, N. Y.
 Col. and Asst. Surg. Gen., U.S.A.,
 Governor's Island, New York, N. Y.
 Maj. and Surg., U.S.V.,
 Capt. and Asst. Surg., U.S.A.,
 Mania, P. I.
 Brig. Gen., and Surg. Gen. (Ret.), Iowa,
 116 W. 2d St., Muscatine, Ia.
 Ex-Brig. Gen. and Surg. Gen., Ohio,
 Dayton, Ohio.
 1st Lt. and Asst. Surg. U.S.A.,
 Care Navy Dept., Washington, D. C.
 Fort Schuyler, N. Y.
 Lt. and Surg., N.M., N.G.N.Y.,
 407 Clinton St. Brooklyn, N. Y.
 Ex-Lt. Col., Surg. in Chief, N.G.P.,
 Pittsburg, Pa.
 Lt. Col. and Div. Surg., N.G.Cal.,
 Maj. and Surg. Cal. V.I.,
 111 Eddy St., San Francisco, Cal.

ELECTED.

- 1894 McCaw, William J.,
 1900 McClintic, Thomas Brown,
 1899 McComb, J. Baldwin,
 1898 McCord, Thomas Chester,
 1901 McCormick, Louis P.,
 1894 McDill, John R.,
 1900 Mahoney, George William,
 1891 Mann, Alban L.,
 1891 Marion, Otis H.,
 1894 Marmion, Robert Augustine,
 1895 Marsh, William H.,
 1893 Martin, Edward,
 1896 Martin, Frank H.,
 1894 Mason, Charles Field,
 1895 Maus, Louis Mervin,
 1898 Maybury, William Jordan,
 1897 Mayer, Daniel,
 1901 Meacham, Franklin Adams.
 1895 Mead, Harry,
 1895 Meyer, Robert C. J.,
 Maj. and Surg., R.I.M.,
 222 Benefit St., Providence, R. I.
 Asst. Surg., U.S.M.H.S.,
 Southport, N. C.
 Capt. and Asst. Surg., O.N.G.,
 217 E. State St., Columbus, O.
 Maj. and Surg., I.N.G.,
 Maj. and Surg., Ill.V.I.,
 Paris, Ill.
 Capt. and Asst. Surg., N.G. a.,
 Connellsville, Pa.
 Maj. and Surg., U.S.V.,
 Manila, P. I.
 Capt. and Asst. Surg., I.N.G.,
 Capt. and Asst. Surg., Ill.V.I.,
 100 State St., Chicago, Ill.
 Maj. and Surg. (Ret.), I.N.G.,
 214 Chicago St., Elgin, Ill.,
 Lt. Col., and Med. Dir., M.V.M.,
 Maj. and Surg., Mass. V.I.,
 22 Harvard Ave., Allston Station,
 Boston, Mass.
 Medical Director (Capt.), U.S.N.,
 Navy Dept., Washington, D. C.
 Act. Asst. Surg., U.S.M.H.S.,
 Solomons, Md.
 Maj. and Surg., N.G. Pa.,
 Maj. and Brig. Surg., U.S.V.,
 415 S. 15th St., Philadelphia, Pa.
 1st Lt. and Asst. Surg., Kars. V. I.,
 Topeka, Kans.
 Maj. and Surg., U.S.V.,
 Capt. and Asst. Surg., U.S.A.,
 Fort Sam Houston, San Antonio, Texas.
 Lt. Col. and Chief Surg., U.S.V.,
 Maj. and Surg., U.S.A.,
 Manila, P. I.
 Col. and Surg. Gen. (Ret.) of Maine,
 Saco, Me.
 Brig. Gen. and Surg. Gen., W. Va.,
 Charleston, W. Va.
 Maj. and Surg., U.S.V.,
 Manila, P. I.
 Capt. and Asst. Surg., N.G.N.Y.,
 1st Lt. and Asst. Surg., N.Y.V.I.,
 758 Elmwood Ave., Buffalo, N. Y.
 Ensign and Asst. Surg. Ill. N.R.,
 Moline, Ill.

ELECTED.

1895	Middleton, Johnson Van Dyke,	Lt. Col., Dep. Surg. Gen. (Ret.), U.S.A. Occidental Hotel, San Francisco, Cal.
1900	Milligan, Samuel Cargill,	Maj. and Surg., N.G.Pa., 1st Lt. and Asst. Surg., Pa.V.I., 609 Smith Block, Pittsburg, Pa.
1900	Miner, Charles H.,	1st Lt. and Asst. Surg., N.G.Pa., 1st Lt. and Asst. Surg., Pa.V.I., Wilkesbarre, Pa.
1900	Montelius, Ralph W.,	Maj. and Surg., N.G.Pa., 1st Lt. and Asst. Surg., a.V.I., Mt. Carmel, Pa.
1895	Moore, Henry McIntyre Worthington	Lt. Col. and Chief Surg., O.N.G., Maj. and Surg. Ohio V.L.A., 656 E. Long St., Columbus, Ohio.
1900	Moore, John Miller,	P. A. Surg., (Lt.), U.S.N., Care Navy Dept., Washington, D. C.
1895	Morris, Lewis,	P. A. Surg. (Lt.), U.S.N., Care Navy Dept., Washington, D. C.
1898	Morris, Lewis Coleman,	Capt. and Asst. Surg., Ala.N.G., Chalifaux Bldg., Birmingham, Ala.
1898	Morse, William E. H.,	Capt. and Asst. Surg., N.G.Ia., Algona, Kossuth Co., Ia.
1900	Munson, Edward Lyman,	Capt. and Asst. Surg., U.S.A., Surg. Generals Office, Washington, D. C.
1900	Murray, Frank W.,	Maj. and Surg. (Ret.), N.G.N.Y., 37 W 39th St., New York, N. Y.
1894	Murray, Robert Drake,	Surg. U.S.M.H.S., Key West, Fla.
1891	Myers, Charles F. W.,	Lt. Col. and Med. Dir., N.G.N.J., 108 Broadway, Paterson, N. J.
1894	Newgarden, George J.,	Capt. and Asst. Surg., U.S.A., Fort Mason, Cal.
1896	Norton, Oliver Dwight,	Surg. (Lt.), U.S.N., Care Navy Dept., Washington, D. C.
1892	O'Neill, James Wilks,	Maj. and Surg., (Ret.), N.G.Pa., 2110 Spruce St., Philadelphia, Pa.
1897	Osborn, Arthur Leland,	Maj. and Surg., O.N.G., Maj. and Surg., Ohio V. I., Norwalk, Ohio.
1892	Owen, William Otway,	Maj. and Surg. U.S.A., Maj. and Brig. Surg., U.S.V., Manila, P. I.
1895	Parkhill, Clayton,	Col. and Surg. Gen. (Ret.), N.G. Colo., Maj. and Chief Surg., U.S.V., McPhee Bldg., Denver, Colo.
1896	Peck, George,	Med. Dir. (Capt. Ret.), U.S.N., 926 N. Broad St., Elizabeth, N. J.
1900	Peck, Oscar Waite,	Brig. Gen., and Surg., Gen., Vermont, Winooski, Vt.
1897	Peckham, Charles F.,	Lt. and Surg., N.B.R.I.M., 176 Benefit St., Providence, R. I.

ELECTED.

- 1892 Peckham, Cyrus T., Surgeon, U.S.M.H.S., Galveston, Tex.
- 1897 Penrose, George H., Capt. and Q.M., U.S.A., War Dept., Washington, D. C.
- 1895 Percy, Henry Tucker, Surg. (Lt. Comdr.), U.S.N., Care Navy Dept., Washington, D. C.
- 1894 Perley, Henry Otis, Maj. and Surg., U.S.A., Manila, P. I.
- 1896 Persons, Remus Charles, Medical Inspector (Comdr.), U.S.N., Care Navy Dept., Washington, D. C.
- 1897 Pesold, Carl, Maj. and Surg., N.G.Mo., 1502 Wagoner Pl., St. Louis, Mo.
- 1900 Peters, Jacob Mark, 1st Lt. and Asst. Surg., N.G.Pa., Steelton, Pa.
- 1896 Pettigrew, George Atwood, Col. and Surg. Gen., N.G.S.Dak., Flandreau, S. Dak.
- 1901 Phelan, Henry du R., Capt. and Asst. Surg., U.S.V., Manila, P. I.
- 1897 Phillips, Albert William, Brig. Gen., Surg. Gen. (Ret.), C.N.G., Derby, Conn.
- 1900 Phillips, Frank L., Ex-Act. Asst. Surg., U.S.M.H.S., Escanaba, Mich.
- 1894 Phillips, John Leighton, Maj. and Surg. U.S.A., Maj. and Chief Surg. U.S.V., Manila, P. I.
- 1901 Pierce, Norval H., Lt. and P. A. Surg., Ill. N. M., 31 Washington St., Chicago, Ill.
- 1900 Pleadwell, Frank Lester, P. A. Surg. (Lt. j. g.), U.S.N., Care Navy Dept., Washington, D. C.
- 1897 Pope, Benjamin Franklin, Lt. Col. and Dep. Surg. Gen. U.S.A., Lt. Col. and Chief. Surg. U.S.V., Manila, P. I.
- 1894 Porter, Joseph Y., Maj. and Surg., S. T. Fla., Jacksonville, Fla.
- 1900 Potteiger, George Frederick, 1st Lt. and Asst. Surg. N. G. Pa., Maj. and Surg. Pa. V. I., Hamburg, Pa.
- 1899 Powell, Seneca Daniel, Maj. and Brig. Surg., N.G.N.Y., 12 W. 40th St., New York, N. Y.
- 1894 Priestley, James Taggart, Brig. Gen. and Surg. Gen., Iowa, 707 E. Locust St., Des Moines, Ia.
- 1892 Pritchett, Gilbert L., Maj. and Surg., N. G. Neb., Fairbury, Neb.
- 1895 Purviance, William E., Capt. and Asst. Surg., U.S.A., Presidio, San Francisco, Cal.
- 1900 Ralston, B. Stewart, 1st Lt. and Asst. Surg., N. G. Pa., Penn. Ave., and Main St., Pittsburg, Pa.
- 1897 Rannels, David A., Maj. and Surg. O. V. I., Capt and Asst. Surg., O. N. G., McArthur, O.
- 1900 Raymond, Henry I., Maj. and Surg., U.S.A., Maj. and Brig. Surg., U.S.V., Pullman Bldg., Chicago, Ill.

ELECTED.

1898	Reed, Robert Harvey,	Col. and Surg. Gen. of Wyoming, Rock Springs, Wyo.
1894	Reed, Walter,	Maj. and Surg., U.S.A., Surg. Gen'l's Office, Washington, D. C.
1894	Reynolds, Frederick P.,	Capt. and Asst. Surg., U.S.A., Washington Barracks, D. C.
1898	Rhoads, Thomas Leidy,	1st Lt. and Asst. Surg., U.S.A., Manila, P. I.
1899	Richard, Charles,	Maj. and Surg., U.S.A., Fort Leavenworth, Kan.
1901	Richards, Josiah Williams,	Contract Surg., U.S.A., Fort Mott, Salem, N. J.
1896	Richards, Theodore W.,	P. A. Surg. (Lt.), U.S.N., Care Navy Dept., Washington, D. C.
1900	Richings, Henry,	Maj. and Surg., I.N.G., Rockford, Ill.
1895	Richardson, William Lambert,	Lt. Col. and Med. Dir., M.V.M., 225 Commonwealth Ave., Boston, Mass.
1897	Rieg, Philip S.,	Ensign and Asst. Surg., N.B., O.N.G., 338 Summit St., Toledo, O.
1900	Ritchie, Harry Parks,	1st Lt. and Asst. Surg., N.G., Minn., St. Paul, Minn.
1896	Ritter, F. Horace S.,	1st Lt. and Asst. Surg., N.G.N.Y., 314 E. Church St., Elmira, N. Y.
1895	Rixey, Presley Marion,	Medical Inspector, (Comdr.), U.S.N., Naval Dispensary, Washington, D. C.
1898	Roberts, Thomas Elmer,	Capt. and Asst. Surg., I.N.G., Capt. and Asst. Surg., Ill.V.I., 144 S. Oak Park Ave., Oak Park, Ill.
1891	Robertson, Charles Moore,	Maj. and Surg., N.G.Ia., Maj. and Chief Surg., U.S.V., Davenport, Ia.
1893	Robins, Robert Patterson,	Capt. and Asst. Surg., U.S.V., 1st Lt. and Asst. Surg., N.G.Pa., 2110 Pine St., Philadelphia, Pa.
1900	Robinson, John Franklin,	Maj. and Surg. (Ret.), N.G.N.H., The Kinnard, Manchester, N.H.
1896	Rockwell, Thomas F.,	Maj. and Surg., C.N.G., Maj. and Surg., Conn.V.I., Rockville, Conn.
1894	Rolfe, William Alfred,	1st Lt. and Asst. Surg., M.V.M., 1st Lt. and Asst. Surg., Mass.V.H.A., 549 W. Newton St., Boston, Mass.
1901	Root, Matt R.,	Maj. and Surg., N.G.Colo., 1st Lt. and Asst. Surg., U.S.V.C., 209 Jackson Block, Denver, Colo.
1900	Rothert, William Henry,	Capt. and Asst. Surg., O.N.G., 1632 Freeman St., Cincinnati, O.

ELECTED.

1900	Rowe, Jesse,	Capt. and Asst. Surg., I.N.G., Capt. and Asst. Surg., Ill.V.I., Abingdon, Ill.
1901	Rowe, William H.,	1st Lt. and Asst. Surg., Minn.N.G., St. James, Minn.
1900	Runnels, Orange S.,	Col. and Surg. Gen., Ind.N.G., Indianapolis, Ind.
1901	Santoire, Henri Alexis,	Contract Surg., U.S.A., Fort Greble, Jamestown, R. I.
1895	Sawtelle, Henry Winchester,	Surg., U.S.M.H.S., Chicago, Ill.
1894	Schuyler, Clarkson C.,	1st Lt. and Asst. Surg. (Ret.), N.G.N.Y., Box 212, Plattsburg, N. Y.
1894	Scofield, Walter Keeeler,	Med. Dir. (Capt. Ret.), U.S.N., Philadelphia, Pa.
1900	Seaman, Louis Livingston,	Maj. and Surg. U.S.V.E., 118 W. 31st St., New York, N. Y.
1900	Senn, William Nicholas,	1st Lt. and Asst. Surg., I.N.G., 532 Dearborn Ave., Chicago, Ill.
1893	Sevey, Harry Sheldon,	Capt. and Asst. Surg. (Ret.), N.G.S.D., Arizpe, Sonora, Mexico.
1894	Shannon, William C.,	Maj. and Surg. (Ret.), U.S.A., Elkhorn, Neb.
1894	Shaw, John Bliss,	Maj. and Surg., I.N.G., Maj. and Surg., Ill.V.I., Joliet, Ill.
1896	Shipp, Edward Mansfield,	P. A. Surg. (Lt.), U.S.N., Care Navy Dept., Washington, D. C.
1899	Shoemaker, John Veitch,	Col. and Surg. Gen. of Pennsylvania, 1519 Walnut St., Philadelphia, Pa.
1892	Silliman, James E.,	Maj. and Surg., N.G.Pa., 137 W. 5th St., Erie, Pa.
1901	Simonton, Albert H.,	Contract Surg., U.S.A., Fort Robinson, Neb.
1892	Simpson, James Edwin,	Maj. and Surg., M.V.M., 348 Essex St., Salem, Mass.
1897	Skene, William H..	1st Lt. and Asst. Surg., M.G.N.Y., 143 Clinton St., Brooklyn, N. Y.,
1894	Skinner, John O..	Maj. and Surg. (Ret.), U.S.A., Chambersburg, Pa.
1893	Smart, Charles,	Col. and Asst. Surg. Gen., U.S.A., 2017 Hillyer Pl., Washington, D. C.
1901	Smart, Robert,	1st Lt. and Asst. Surg., U.S.A., Fort Monroe, Va.
1895	Smith, Allen V.,	Capt. and Asst. Surg., O.N.G.
		Capt. and Asst. Surg., O.V. I., Canton, O.
1895	Smith, French W.,	1st Lt. and Asst. Surg., W.Va.S.T., Bluefield, W. Va.

ELECTED.

- 1895 Smith, George Tucker,
Care Navy Dept., Washington, D. C.
- 1898 Smith, Reginald K.,
Care Navy Dept., Washington, D. C.
- 1893 Smith, William Lloyd.
Maj. and Surg., I. N. G.,
366 S. Park St., Streator, Ill.
- 1900 Spence, Thomas Bray,
Capt. and Asst. Surg., N. G. N. Y.,
Capt. and Asst. Surg., N. Y. V. I.,
139 7th Ave., Brooklyn, N. Y.
- 1897 Srodes, J. Lewis,
Maj. and Surg., Pa. V. I.,
1st Lt. and Asst. Surg., N. G. Pa.,
742 Penna. Ave., Wilksnsburg, Pa.
- 1893 Standish, Myles,
Capt. Com. Amb. Corps, M. V. M.,
6 St. James Ave., Boston, Mass.
- 1898 Stanton, Samuel Cecil,
Assistant Secretary 1899-1901.
1st Lt. and Asst. Surg., I. N. G.,
Contract Surg., U.S.A.,
9 Cedar St., Chicago, Ill.
- 1897 Stark, William T.,
Lt. Col. and Asst. Adj. Gen., N. G. Mo.,
Kansas City, Mo.
- 1894 Stayer, Andrew Snowberger,
Maj. and Surg. N. G. Pa.,
Maj. and Surg. Pa. V. I.,
1501 7th Ave., Altoona, Pa.
- 1898 Stedman, Joseph Cyrus,
2d Lt. Amb. Corps, M. V. M.,
116 Sedgwick St., Boston, Mass.
- 1897 Stephenson, Franklin Bache,
Medical Inspector (Comdr.), U.S.N.,
Care Navy Dept., Washington, D.C.
- 1897 Stephenson, William,
Maj. and Surg., U.S.A.,
Maj. and Brig. Surg., U.S.V.,
Manila, P. I.
- 1893 Sternberg, George Miller,
President 1894-95.
Brig. Gen. and Surg. Gen., U.S.A.,
Washington, D. C.
- 1898 Steward, Edward Larkin,
1st Lt., and Asst. Surg., F.S.T.,
Starke, Fla.
- 1895 Stewart, Walter Scott,
Maj. and Surg., Pa.V.I.,
1st Lt. and Asst. Surg., N.G.Pa.,
52 S. Franklin St., Wilkesbarre, Pa.
- 1901 Stieren, Edward,
1st Lt. and Asst. Surg., N.G.Pa.,
219 6th St., Pittsburg, Pa.
- 1894 Stiles, Henry Ranney,
Capt. and Asst. Surg., U.S.A.,
Manila, P. I.
- 1896 Stitt, Edward R.,
Surg. (Lt.), U.S.N.,
Care Navy Dept., Washington, D.C.
- 1899 Stone, Alexander J.,
President 1900-01.
Brig. Gen., Surg. Gen. (Ret.), Minnesota
Lowry Arcade, St. Paul, Minn.
- 1901 Stone, John Hamilton,
Capt. and Asst. Surg., U.S.A.,
Matanzas, Cuba.
- 1900 Stoner, George W.,
Surg. U.S.M.H.S.,
Stapleton, Staten Island, N. Y.
- 1899 Stover, Bruce H.,
1st Lt. and Asst. Surg., N.G.Ia.,
Carroll, Iowa.

ELECTED.

- 1891 Streeter, John Williams.
 1897 Stroud, Harrison Edward,
 1896 Sullivan, Thomas J.,
 1901 Sweet, Charles F.,
 1896 Taneyhill, G. Lane,
 1894 Taylor, Walter L.,
 1892 Terriberry, George W.,
 1895 Terry, Marshall Orlando,
 1895 Thayer, Frederick C.,
 1893 Thomson, Archibald G.,
 1900 Thompson, Hiram Benson,
 1901 Thornburgh, Robert M.,
 1899 Torney, George H.,
 1899 Townsend, Joseph Hendley,
 1900 Trecartin, David Munson,
 1894 Tuholske, Herman.
 1893 Turnbull, Charles Smith,
 1896 Turner, William D.,
 1895 Tuttle, Jay,
 1894 Twitchell, Herbert Eugene,
 1900 Vaughan, George Tully,
 1895 Wakeman, William James,
- Lt. Col. and Asst. Surg. Gen., I.N.G.,
 2646 Calumet Ave., Chicago, Ill.
 Col. and Surg. Gen. Arizona,
 Phoenix, Ariz.
 Maj. and Surg., I.N.G.,
 Maj. and Surg., Ill.V.I.,
 4709 Michigan Ave., Chicago, Ill.
 Maj. and Surg., R.I.M.,
 38 N. Union St., Pawtucket, R. I.
 Maj. and Surg. (Ret.), N.G.Md.,
 1103 Madison Ave., Baltimore, Md.
 Ex-Capt. and Asst. Surg., O.N.G.,
 933 Grand Ave., Cincinnati, O.
 Col. and Div. Surg., N.G.N.J.,
 146 Broadway, Paterson, N. J.
 Ex-Brig. Gen., Surg. Gen., N.G.N.Y.,
 196 Genesee St., Utica, N. Y.
 Col. and Surg. Gen., Me.V.M.,
 119 Maine St., Waterville, Me.
 Maj. and Surg. Pa.V.I.,
 1st Lt. and Asst. Surg., N.G.Pa.,
 1426 Walnut St., Philadelphia, Pa.
 Maj. and Surg. C.N.G.,
 Maj. and Surg. Conn.V.I.,
 New London, Conn.
 1st Lt. and Asst. Surg., U.S.A.,
 Fort Slocum, N. Y.
 Maj. and Surg., U.S.A.,
 Army and Navy General Hospital,
 Hot Springs, Ark.
 Maj. and Surg., C.N.G.,
 39 College St., New Haven, Conn.
 Ensign and Asst. Surg., N.B.C.N.G.,
 352 State St., Bridgeport, Conn.
 Maj. and Surg. N.G.Mo.,
 410 N. Jefferson St., St. Louis, Mo.
 Maj. and Surg., N.G.Pa.,
 1935 Chestnut St., Philadelphia, Pa.
 Maj. and Surg., Va.V.,
 Fergusson's Wharf, Va.
 Act. Asst. Surg., U.S.M.H.S.,
 Astoria, Oregon.
 Capt. and Asst. Surg., O.N.G.,
 Capt. and Asst. Surg., Ohio V.I.,
 24 S. B St., Hamilton, O.
 Surg. U.S.M.H.S.,
 Maj. and Brig. Surg., U.S.V.,
 816 17th St., Washington, D. C.
 Maj. and Surg., U.S.A.,
 Maj. and Brig. Surg., U.S.V.,
 Manila, P. I.

ELECTED.

1894	Wallace, David L.,	Maj. and Surg., N.G.N.J., 192 Clinton Ave., Newark, N. J.
1896	Wallace, Henry,	Maj. and Surg., N.Y.V.I., Capt. and Asst. Surg., N.G.N.Y., 183 Congress St., Brooklyn, N. Y.
1899	Walls, Charles Bruce,	1st Lt. and Asst. Surg., I.N.G., 1st Lt. and Asst. Surg., Ill.V.I., 1003 Warren Ave., Chicago, Ill.
1900	Warbasse, James Peter,	Capt. and Asst. Surg., N.G.N.Y., Ex-Acting Asst. Surg., U.S.A., 68 Greene Ave., Brooklyn, N. Y.
1896	Ward, John M. Broomall,	1st Lt. and Asst. Surg., N.G.Pa., 1st Lt. and Asst. Surg., Pa.V.I., Quarantine Station, Marcus Hook, Pa.
1897	Warfield, Ridgley Brown,	Brig. Gen. and Surg. Gen., Maryland, 214 W. Franklin St., Baltimore, Md.
1896	Waters, William E.,	Lt. Col., Dep. Surg. Gen. (Ret.), U.S.A., Care Surg. Gen., Washington, D. C.
1893	Watson, Wilbur S.,	Lt. Col. and Med. Dir., C.N.G., 66 West St., Danbury, Conn.
1896	Weaver, Clarence A.,	Capt. and Surg., N.G.D.C., 1st Lt. and Asst. Surg., D.C.V.I., 1614 Q. St. N. W., Washington, D. C.
1892	Weaver, Joseph K.,	Lt. Col. and Chief Surg., N.G., Pa., Maj. and Brig. Surg., U.S.V., Norristown, Pa.
1893	Wertenbaker, Charles Poindexter, P. A. Surg., U.S.M.H.S.,	New Orleans, La.
1897	Westervelt, William Alfred, <i>Assistant Secretary, 1897-99.</i>	Maj. and Surg., O.N.G., Maj. and Surg., Ohio V.I., 62 E. Broad St., Columbus, O.
1891	Wheaton, Charles A.,	Brig., Gen., Surg. Gen., (Ret.), Minn., 326 Wabasha St., St. Paul, Minn.
1897	Wheaton, James Lucas,	1st Lt. Hosp. Corps, R.I.M., Summer St., Pawtucket, R. I.
1899	Whitcomb, Edward H.,	Maj. and Asst. Surg. Gen., N.G. Minn., 199 E. 7th St., St. Paul, Minn.
1899	White, William Seymour,	1st Lt. and Asst. Surg., I.N.G., 370 Warren Ave., Chicago, Ill.
1900	Whiting, Joseph B., jr.,	Maj. and Surg., Wis.N.G., 1st Lt. and Asst. Surg., U.S.V., Janesville, Wis.
1897	Wieber, Francis Wm. Ferdinand,	Surg. (Lt.), U.S.N., Care Navy Dept., Washington, D. C.
1891	Wilkie, Frederick J.,	Maj. and Surg., Wis.N.G., 61 Merritt St., Oshkosh, Wis.
1897	Willard, William G.,	Maj. and Surg., I.N.G., Maj. and Surg., Ill.V.I., 544 Washington Boul., Chicago, Ill.

ELECTED.

1895	Willcox, Charles,	Maj. and Surg., U.S.V., Capt. and Asst. Surg., U.S.A., Manila, P. I.
1897	Williams, John Hey,	Col. and Surg. Gen., North Carolina, 53 Haywood St., Asheville, N. C.
1897	Wilson, Charles E.,	Maj. and Surg., Mo.V.I., Capt. and Asst. Surg., N.G.Mo., 906 Main St., Kansas City, Mo.
1898	Wilson, George Brinton,	Surg. (Lt.), U.S.N., Care Navy Dept., Washington, D. C.
1897	Wilson, James Sprigg,	Maj. and Surg. U.S.V., Capt. and Asst. Surg., U.S.A., Manila, P. I.
1900	Wilson, William Henry,	Capt. and Asst. Surg., U.S.A., Fort McDowell, Cal.
1891	Wilson, William W.,	Ex-Capt., Asst. Surg., Ind. Inf. Legion, 620 3d St., Wausau, Wis.
1894	Wise, John Cropper, <i>First Vice-President 1900-1901.</i> <i>Second Vice-President. 1897-99.</i>	Med. Dir. (Captain), U.S.N., Care Navy Dept., Washington, D. C.
1896	Wood, Frederick John Jennings,	Maj. and Surg., N.G.N.Y., 199 DeKalb Ave., Brooklyn, N. Y.
1895	Wood, Marshall, William,	Maj. and Surg., U.S.A., Jefferson Barracks, Mo.
1894	Woodhull, Alfred Alexander,	Col. and Asst. Surg. Gen. (Ret.), U.S.A., Princeton, N. J.
1893	Woodruff, Charles Edward.	Maj. and Surg., U.S.A., Maj. and Brig. Surg., U.S.V., Fort Riley, Kan.
1896	Woodruff, Ezra,	Lt. Col. and Dep. Surg. Gen., U.S.A., Fort Hamilton, N. Y.
1896	Woods, George Worth, <i>Second Vice-President 1899-1900.</i>	Med. Dir. (Capt. Ret.), U.S.N., Care Navy Dept., Washington, D. C.
1898	Wright, Arthur Lee,	Maj. and Surg., N.G.Ia., Carroll, Iowa.
1899	Wright, John William,	Maj. and Surg., Pa.V.I., 1st Lt. and Asst. Surg., N.G.Pa., 18 E. 8th St., Erie, Pa.
1897	Wright, Thompson B.,	Capt. and Asst. Surg., O.N.G., Circleville, Ohio.
1894	Wyeth, Marlborough Churchill,	Maj. and Surg., U.S.A., Maj. and Brig. Surg., U.S.V., Havana, Cuba.
1898	Wylie, Winfred,	Col. and Surg. Gen., Arizona, Phoenix, Ariz.
1901	Wyman, Walter, <i>Honorary Member, 1892-1901.</i> <i>Second Vice-President, 1901-1902.</i>	Supervising Surg. Gen., U.S.M.H.S., Washington, D. C.
1894	York, George William,	Maj. and Surg., N.G.N.Y., 190 Franklin St., Buffalo N. Y.

ASSOCIATE MEMBERS.

1899	Adams, William Arnold,	Ex-Lt. Col. and Med. Dir., Tex.V.G., Equitable Bldg., St. Louis, Mo.
1897	Asch, Morris J.,	Ex-Maj. and Surg., U.S.A., 5 W. 30th St., New York, N. Y.
1898	Board of Officers,	Sixty-Fifth Regt., N.G.N.Y., Buffalo, N. Y.
1897	Conner, Phineas S.,	Ex-Bvt. Maj. and Asst. Surg., U.S.A., 215 W. 9th St., Cincinnati, O.
1901	Fox, Charles James.	Brig. Gen. and Surg. Gen. (Ret.) C.N.G., Willimantic, Conn.
1894	Donnelly, Richard A.,	Brig. Gen. and Q. M. Gen., N. J., Trenton, N. J.
1900	Haller, John Frederick,	1st Lt. and Asst. Surg. (Ret.), R.I.M., 623 Macon St., Brooklyn, N. Y.
1897	Hamilton, Charles S.,	Ex-Capt. and Asst. Surg., O.N.G., 142 E. Long St., Columbus, O.
1897	Hart, Hugh A.,	Ex-Brig. Gen. and Surg. Gen., O.N.G., Wooster, O.
1897	Manley, Thomas H.,	Ex-Capt. and Asst. Surg., U.S.V., 115 W. 49th St., New York, N. Y.
1901	Marcy, Henry Orlando,	Lt. Col. and Med. Dir., U.S.V.(Civil War), 180 Commonwealth Ave., Boston, Mass.
1892	Moore, Milton,	Brig. Gen. Comdg. 1st Brig., N.G.Mo., N. Y. Life Bldg., Kansas City, Mo.
1896	Morris, Henry,	Ex-1st Lt. and Asst. Surg., N.G.Pa., 313 S. 16th St., Philadelphia, Pa.
1896	Osgood, Frederick Huntington,	1st Lt. and Vet. Surg., M.V.M., 50 Village St., Boston, Mass.
1894	Sander, Enno,	Ex-Maj. and Brig. Q. M. Enr. Mo. Mil., 129 S. 11th St., St. Louis, Mo.
1899	Southard, William Freeman,	Ex-Maj. and Surg., M. V. M., 1220 Sutter St., San Francisco, Cal.
1894	Spencer, Bird Wilson,	Brig. Gen., Ins. Gen. R. P., N.G.N.J., Passaic, N. J.
1899	Trader, John Wesley,	Ex-Maj. and Surg., N.G.Mo., Sedalia, Mo.
1894	Truax, Charles,	44 Wabash Ave., Chicago, Ill.
1896	Van Pelt, Joseph K. T.,	Ex-Maj., Brig. Surg., U.S.V., (Civil War.), 1529 Spruce St., Philadelphia, Pa.
1896	Wagner, Clinton,	Ex-Bvt. Lt.-Col. and Surg., U.S.A., 19 E. 38th St., New York, N. Y.
1897	Whitaker, Hervey Williams,	Ex-P. A. Surg. (Lt.), U.S.N., 72 Grant Ave., Columbus, O.
1900	Wirt, William Edgar,	Lt. Comdr., N.B., O.N.G.
1896	Younger, William J.,	Ex-Lt., U.S.N., 477 Prospect St., Cleveland, O.
		Ex-Col. and Med. Dir., N.G.Cal., 200 Stockton St., San Francisco, Cal.

CORRESPONDING MEMBERS.

ELECTED.

- 1899 Sir W. Mitchell Banks, M.D., F.R.C.S., 28 Rodney St., Liverpool, England.
- 1899 Surg. Lt. Col. Fred W. Borden, Minister of Militia and Defense, Ottawa, Canada.
- 1897 General Epifanio Cacho, General Jefe del Cuerpo Medico Militar Mexicano (Surg., Gen. Mexican Army), Ciudad Mexico, Mexico.
- 1897 Captain Hans Daal, Sanitary Captain, Norwegian Army, Christiania, Norway.
- 1900 Major Narciso del Rio, Cuerpo Medico Militar Mexicano, Vera Cruz, Mexico.
- 1892 Medicinalrad Edvard Martin Edholm, Ofverfaltlakare vid armeen, (Surg. Gen. Swedish Army), Stockholm, Sweden.
- 1897 Surgeon Captain Rory Fletcher, Ex-Surg., Central London Rangers, Care Capt. A. K. Fletcher, Hillcroome, Sutton, Surrey, England.
- 1892 General Thien Ho, Med. Inspector General Siamese Army, Bangkok, Siam.
- 1897 Docent Dr. Otokar Kukula, K. K. Assistenzarzt, (Asst. Surg., Austro-Hungarian Army), Prague, Austro-Hungary.
- 1897 Coronel Fernando Lopez, Coronel Medico Ciruj., Director Hosp. de Mexico (Col. and Dir. Hosp. of Instruction, Mexican Army) Ciudad Mexico, Mexico.
- 1899 Surg. Col. William McWatters, Royal Army Medical Corps, Care Holt & Co., 3 Whitehall Place, London, England.
- 1899 Tente. Cor. Zacharias R. Molina, Cuerpo Medico Militar Mexicano, Vera Cruz, Mexico.
- 1900 Surg. Lieut. Col. J. L. H. Neilson, Dir. Gen., Med. Dept., Canadian Militia, Ottawa, Canada.
- 1896 Professor Nicolaysen, University of Norway, Christiania, Norway.
- 1897 General William Silver Oliver, Dep. Surg. Gen., British Army M. D., 127 South Park St., Halifax, N. S.
- 1892 Sir J. O'Neil, C. B., Surg. Gen. (Ret.), Indian Med. Service, London, England.
- 1892 Dr. Adolph Alexandrovitch Remert, Inspecteur général de service de santé militaire, Inginneraia and Bolchaia Sadovaia Streets, St. Petersburg, Russia.
- 1899 Dr. Karl Rudberg, Staff Surgeon Swedish Navy, Stockholm, Sweden.
- 1892 Surg. Lt. Col. George Sterling Ryerson, Dep. Surgeon General, Canadian Militia, 60 College St., Toronto, Ontario.

- 1892 Generalmajor Johan Frederik Sanitetsgeneral og Chef, Kongelige Regerings Forsvars-Department, (Surgeon General Royal War Ministry), Christiania, Norway.
- 1899 Lt. Commander Dr. Tomat Suri, Surgeon, Imperial Japanese Navy, Tokyo, Japan.
- 1892 M. G. M. F. Vanderlinden, Inspecteur général de service de santé militaire, Saint-Josseten-Noode, Belgium.
- 1891 General Stabsarzt, Prof. Dr. E. von Bergmann, Geheimer Med. Rath (Surgeon General, 1st Class, Brigadier General), Kriegs Ministeriums, Berlin, Germany.
- 1892 Excellenz General Stabsarzt der Armee, Prof. Dr. von Coler, Chef der Medizinal Abtheilung des Kriegs Ministeriums (Surgeon General, German Army, Chief of the Medical Section of the War Ministry, Major General.) Kriegs Ministeriums, Berlin, Germany.
- 1891 General Stabsarzt, Prof. Dr. Fr. von Esmarch, Geheimer Med. Rath (Surgeon General ist Class, Brigadier General), Kiel, Germany.
- 1892 Excellenz Generalarzt, Dr. Eduard von Fichte, Chef der Med. Abtheilung in Königl. Württembergischen Kriegs Ministeriums, (Surgeon General, 1st class, Chief of the Medical Section of the Royal Württemberg War Ministry). Stuttgart, Germany.
- 1892 Colonel Adolf Ziegler, Médecin en chef de l'armée fédérale Suisse, Departement militaire, Berne, Switzerland.



HONORARY MEMBERS.

ELECTED.

- 1899 Barton, Miss Clara,
 1894 Book, James B.,
 1894 Brinton, John H.,
 1900 Byers, Frederick Weils,
Active Member, 1891-1900.
 1901 Fenger, Christian,
 1895 Flint, Austin,
 1900 Gihon, Albert Leary,
Active Member 1892-1900,
Second Vice-President, 1894-95,
First Vice-President, 1895-96,
President-1896-97.
 1899 Gould, Miss Helen Miller,
 1891 Henrotin, Fernand,
 1897 Humiston, William Henry,
 1891 Irwin, Bernard John Dowling,
 1894 Keen, William Williams,
 1892 Kimball, Abner D.,
 1897 Kober, George Martin,
 1894 Love, Isaac Newton,
 1899 McGee, Dr. Anita Newcomb,
 1892 McIntyre, John H.,
 1899 Merrill, Mrs. John F.,
 1894 Mills, Hiram R.,
 1895 Moore, John,
 1895 Murray, Robert,
 1895 Page, Charles,
- Prest. Am. National Red Cross Assn.,
 Glen Echo, Md.
 Lt. Col. and Surg. Gen. (Ret.), M.S.T.,
 33 Campau Bldg., Detroit, Mich.
 Ex-Maj., Brig. Surg., U.S.V. (Civil War),
 1423 Spruce St., Philadelphie, Pa.
 Brig. Gen., Surg. Gen. (Ret.), Wis.N.G.,
 Monroe, Wis.
 Lt. and Asst. Surg. (Ret.), Danish Army,
 269 Lasalle Ave., Chicago, Ill.
 Ex-Surg. Gen. of New York,
 Ex-Act. Asst. Surg., U.S.A., (Civil War)
 60 E. 34th St., New York, N. Y.
 Medical Director (Commodore Ret.),
 United States Navy,
 Reform Club,
 New York,
 N. Y.
 Asst. Dir. Gen. Woman's National War
 Relief Association.
 Irvington-on-Hudson, N. Y.
 Maj. and Surg. (Ret.), I.N.G.,
 353 La Salle Ave., Chicago, Ill.
 Ex-Pres. Ohio State Medical Society,
 122 Euclid Ave., Cleveland, O.
 Col. and Asst. Surg. Gen. (Ret.), U.S.A.,
 Cobourg, Ontario.
 Ex-Act. Asst. Surg., U.S.A., (Civil War),
 1729 Chestnut St., Philadelphia, Pa.
 Maj. and Surg., Nat. Mil. Home,
 National Military Home, Ind.
 Ex-Act. Asst. Surg., U.S.A.,
 1819 Q St. N. W., Washington, D. C.
 Lt. Col. and Med. Dir. (Ret.), N.G.Mo.,
 Cor. Euclid and Md. Avs., St. Louis, Mo.
 Ex-Act. Asst. Surg., U.S.A., (Span. War),
 1620 P St., Washington, D. C.
 Maj. and Surg. (Ret.), Ind. Inf. Leg.,
 931 N. Sarah St., St. Louis, Mo.
 Prest. San Francisco Red Cross Society,
 San Francisco, Cal.
 Lt. Col. and Surg. Gen. (Ret.), Mich.,
 Port Huron, Mich.
 Brig. Gen. and Surg. Gen. (Ret.), U.S.A.,
 903 16th St. N. W., Washington, D. C.
 Brig. Gen. and Surg. Gen. (Ret.), U.S.A.,
 Castle Creek Hot Springs, Ariz.
 Col. and Asst. Surg. Gen. (Ret.), U.S.A.,
 340 Dolphin St., Baltimore, Md.

1895	Park, Dr. Roswell,	Prof. of Surgery, Univ. of Buffalo., 510 Delaware Ave., Buffalo, N. Y.
1895	Smith, Joseph Rowe,	Col. and Asst. Surg. Gen. (Ret.), U.S.A., 2300 Delancy Pl., Philadelphia, Pa.
1895	Tryon, James Rufus,	Med. Dir. (Rear Admiral, Ret.), U.S.N., Care Navy Dept., Washington, D. C.
1900	Van Reypen, William K.,	Surg. Gen., (Rear Admiral), U.S.N., Washington, D. C.
1899	Walworth, Mrs. Ellen Hardin,	Dir. Gen. Woman's Nat. War Relief Assn., Saladpiè Springs, N. Y.
1896	Wilson, Dr. Ezra Herbert,	Director of the Hoagland Laboratory, 194 Keap St., Brooklyn, N. Y.



Deceased Members.

Active Members.

DIED.

1898	Adams, Charles W.,	Lt. and Asst. Surg., N.G.Mo.,
1899	Armstrong, Francis Caldo,	Maj. and Surg. N.G.Kan.
1898	Bates, Newton L.,	Surg. Gen. (Commodore), U.S.N.
1900	Bergen, Andrew Conover,	Lt. Col. and Dep. Surg. Gen, N.G.Ia.
1898	Boardman, Walter.,	Lt. and Asst. Surg.. N.G.Pa.
1900	Brooke, Benjamin,	Capt. and Asst. Surg., U.S.A.,
1894	Browne, John Mills,	Surg. Gen. (Commodore), U.S.N.
1901	*Crawford, Samuel K.,	Maj. and Surg., N.G.Mo.
1901	*Daly, William Henry,	Maj. and Chief. Surg., U.S.V.
1891	Eggers, John T.,	Capt. and Asst. Surg., N.G.Mo.
1901	Egle, William Henry,	Maj. and Surg., N.G.Pa.
1899	Etheridge, James Henry,	Maj. and Brig. Surg., I.N.G.
1898	Farquhar, Emmer C.,	Maj. and Surg., O.N.G.
1896	Fisher, Walter Wm. Roscoe,	Capt. and Asst. Surg., U.S.A.
1896	Forster, Edward Jacob,	Brig. Gen. and Surg. Gen., M.V.M.
<i>First Vice President 1896-97,</i>		
1900	Gauntt, Franklin,	Lt. Col. and Surg., N.G.N.J.
1892	Halbert, J. E.,	Col. and Surg. Gen., Mississippi.
1898	Hamilton, John B.,	Surg. Gen., U.S.M.H.S.
1894	Hayes, Charles,	Lt. Col. and Med. Dir., R.I.M.
1898	Helm, Scott,	Col. and Surg. Gen., N.G.Ariz.
1896	Hope, James Shirley,	P. A. Surg. (Lt.), U.S.N.
1897	Hutton, Wm. Henry Harrison,	Surg., U.S.M.H.S.
1893	Jessup, Robert B.,	Col. and Surg. Gen., Indiana.
1893	Leach, Hamilton E.,	Capt. and Asst. Surg., N.G.D.C.
1897	Lincoln, Frank T.,	Maj. and Med. Insp., Ga.V.
1896	Macaulay, Carter N. Berkeley,	Capt. and Asst. Surg., U.S.A.
1891	Matthews, Frederick L.,	Col. and Surg. Gen., Illinois.
<i>Secretary 1892-93.</i>		
1898	McElderry, Henry,	Maj. and Surg., U.S.A.
1900	Miller, Truman W.,	Maj. and Surg., I.N.G.
1900	Mudge, Selden J.,	Lt. and Asst. Surg., N.G.N.Y.
1899	Munday, Benjamin,	Capt. and Asst. Surg., U.S.A.
1894	Murphy, John Henry,	Brig. Gen. and Surg. Gen., Minnesota.
1896	Ottolie, Charles,	Act. Asst. Surg., U.S.M.H.S.
1896	Pickman, H. Derby,	Brig. Gen. and Surg. Gen., Montana.
1901	Piggott, Michael Royston,	P. A. Surg. (Lt.), U.S.N.
1901	Porter, Alexander Shaw,	Capt. and Asst. Surg., U.S.A.

*Died since last meeting.

DIED.

1900	Read, Louis W., <i>President, 1895-96.</i> <i>First Vice-President 1894-95.</i> <i>Second Vice-President 1893-94.</i>	Col. and Surg. Gen., Pennsylvania.
1899	Robinson, Samuel Quincy,	Maj. and Surg., U.S.A.
1899	Rohé, George Henry,	Maj. and Surg., N.G.Md.
1897	Sanborn, Perley Putnam,	Capt. and Asst. Surg., Ind. Inf. Legion.
1900	Siegfried, Charles A.,	Med. Insp. (Comdr.), U.S.N.
1898	Smith, Lawrence Savery,	Maj. and Surg., N.G. Pa.,
1901	*Tesson, Louis S.,	Maj. and Surg., U.S.A.,
1897	Vaughan, Bolivar Alvear,	Lt. Col., Asst. Surg. Gen., Miss. N.G.
1901	*Ward, Milo Buel,	Maj. and Surg., N.G. Mo.
1896	Woodward, Charles Meredyth, <i>Sec. Vice-President 1892-93.</i>	Lt. Col. and Surg. Gen., Michigan.
1896	Worthington, James Cheston,	Maj. and Surg., U.S.A.

Associate Members.

1901	Grove, John H.,	Brev. Lt. Col., Surg., U.S.V. (Civil War).
1897	Ordway, Albert,	Brig. Gen., Commanding N.G.D.C.

Corresponding Members.

1896	M. Feraud Berenger,	Med. Dir., Marine M. Service, France.
1897	Gen. Darby Bergin, M. P.	Dir. Gen. Med. Dep. Canadian Militia.
1895	M. Leon Jean Colin,	Med. Inspector General, France.
1897	Sir Wm. A. Mackinnon, K. C. B.	Maj. Gen. and Dir. Gen., R. A. M. D.
1896	Giacomo Pecco,	Insp. Gen., Army Med. Service, Italy.
1897	Frederick William Strange,	Dep. Surg. Gen., Canadian Militia.
1894	M. R. Timmerman,	Insp. Gen., Army Med. Serv., Holland.

Honorary Members.

1894	Abbott, Leon,	Governor of New Jersey.
1897	Leighton, Walter H.	Surgeon, Milwaukee Soldiers' Home.
1893	McClellan, Ely,	Lt. Col. and Dep. Surg. Gen., U.S.A.
1894	Porter, Josiah,	Maj. Gen. and Adj. Gen., N.G.N.Y.,
1892	Roth, Wilhelm A.,	Surgeon General, of Saxony.
1895	Sutherland, Charles,	Brig. Gen. and Surg. Gen., U.S.A.

*Died since last meeting.

Minutes of the Meeting.

THE TENTH annual meeting of the Association of Military Surgeons of the United States convened in the Chamber of the House of Representatives of the Minnesota State Capital, on Thursday, Friday and Saturday, May 30 and 31 and June 1, 1901, the President, Brigadier General ALEXANDER J. STONE, Surgeon General, Retired, of Minnesota, in the Chair, and the following members in attendance:

- Lt. Col. Charles Adams, Asst. Surg. Gen., I.N.G.
Col. O. W. Archibald, Surg. Gen. N.G.N.D.
Lieut. H. A. Arnold, Asst. Surgeon, N.G.Pa.
Brig. Gen. Robert A. Blood, Surgeon General, M.V.M.
Med. Dir. Delavan Bloodgood, Med. Dir. (Captain Ret.), U.S. Navy.
Capt. A. E. Bradley, Asst. Surgeon, U.S Army.
Major Albert H. Briggs, Surgeon, N.G.N.Y.
Lieut. J. L. Brubaker, Asst. Surgeon, N.G.Pa.
Brig. Gen. Fred. W. Byers, Surgeon General (Ret.), N.G.Wis.
Major Morris F. Cawley, Surgeon, N.G.Pa.
Major T. C. Clark, Surgeon, N.G.Minn.
Brig. Gen. George Cook, Surg. Gen. (Ret.), N.G.N.H.
Capt. Geo. M. Coon, Asst. Surgeon N.G.Minn.
Lieut. John H. Dorsey, Asst. Surgeon, N.G.Minn.
Major C. E. Dutton, Surgeon N.G. Minn.
Brig. Gen. J. B. Edwards, Surgeon General, N.G. Wis.
Colonel Carroll D. Evans, Surgeon General, N.G.Neb.
Major T. W. Evans, Surgeon, N.G. Wis.
Major David S. Fairchild, Surgeon, N.G.Iowa.
Lieut. Christian Fenger, Asst. Surgeon (Ret.), Danish Army.
Lt. Col. R. J. Fitz Gerald, Med. Director, N.G.Minn.
Lt. Col. Francis C. Ford, Med. Director, T.V.G.
Lt. Col. Chas. H. French, Med. Director, R.I.M.
Lieut. Asa F. Goodrich, Asst. Surgeon, N.G.Minn.
Col. W. W. Grant, Surgeon General of Colorado.
Brig. Gen. J. D. Griffith, Med. Dir. (Ret.), N.G.Mo.
Major Geo. Halley, Brigade Surgeon, N.G.Mo.
Lieut. R. K. Hutchings, Asst. Surgeon, N.G.Colo.
Major W. Jacoby, Surgeon, N.G.Minn.

✓ Dr. Geo. M. Kober, Ex-A. A. Surgeon, U.S.A.
Col. Edward W. Lee, Ex-Surg. Gen., N.G.Neb.
Lt. Col. Henry O. Marcy, Ex-Med. Dir. U.S.V.
Major S. C. Milligan, Brigade Surgeon, N.G.Pa.
Major R. W. Montelius, Surgeon, N.G.Pa.
Lt. Col. Chas. F. W. Myers, Med. Director, N.G.N.J.
Brig. Gen. James T. Priestley, Surgeon General of Iowa.
Col. R. Harvey Reed, Surgeon General of Wyoming.
Major Charles Richard, Surgeon, U.S.Army.
Major Matt. R. Root, Surgeon, N.G.Colo.
Captain Thos. E. Roberts, Asst. Surgeon, I.N.G.
Lieut. W. H. Rowe, Asst. Surgeon, N.G.Minn.
Major Enno Sander, Ex-Major, U.S.V.
Major Louis L. Seaman, Surgeon U.S.Vol.Eng'rs.
Lieut. S. C. Stanton, Asst. Surgeon, I.N.G.
Brig. Gen. A. J. Stone, Surgeon General (Ret.), N.G.Minn.
Mr. Charles Truax, Chicago, Illinois.
Major George T. Vaughan, Surgeon, U.S.M.H.S.
Lt. Col. W. S. Watson, Medical Director, N.G.Conn.
Lt. Col. Joseph K. Weaver, Surgeon in Chief, N.G.Pa.
P. A. Surg. C. P. Wertenbaker, U.S.M.H.S.
Captain Allen A. Wesley, Asst. Surgeon, I.N.G.
Brig. Gen. C. A. Wheaton, Surgeon General (Ret.) N.G.Minn.
Major E. H. Whitcomb, Asst. Surg. Gen., N.G.Minn.
Major A. L. Wright, Surgeon, N.G.Iowa.

FIRST SESSION, THURSDAY MORNING MAY 30, 1901.

The opening session of the Association was called to order by GEN. JOHN F. FULTON, of St. Paul, Chairman of the Committee of Arrangements, at 10 o'clock A. M., in the State Capitol.

The meeting was opened with an invocation by the Most Rev. JOHN IRELAND, Archbishop of St. Paul.

Gen. Fulton then introduced GOVERNOR S. R. VAN SANT who delivered an address of welcome on behalf of the state.

JUDGE E. A. JAGGARD of St. Paul, then welcomed the Association on behalf of the city.

The President's annual address by BRIGADIER GENERAL ALEXANDER J. STONE followed.

The regular routine of business was then taken up and the Secretary read a telegram conveying the greetings and

good wishes of the Association of Medical Officers of the Army and Navy of the Confederacy, as follows:

MEMPHIS, TENN., May 28, 1901.

ALEX. J. STONE, M. D.,
St. Paul.

The Association of medical officers of the Army and Navy of the Confederacy now in session sends cordial and fraternal greetings to the Association of Surgeons of the Army and Navy of the United States.

[Signed] JAMES M. KELLER,
President.

On motion of MAJ. T. C. CLARK., Minn., the telegram was ordered placed on file and the Secretary instructed to make a suitable reply. Pursuant to instruction the following message was transmitted to President Keller:

ST. PAUL, MINN., June 1, 1901.

Col. JAMES M. KELLER, Prest.,
Memphis, Tenn.

The Association of Military Surgeons of the United States sends cordial greetings to the Medical Officers of the army and navy of the Confederacy and by unanimous action welcomes them to membership in this body. Governor Van Sant heartily endorses and approves.

[Signed] ALEX. J. STONE,
President.

LIEUT. COL. CHAS. ADAMS, Ill., Secretary, submitted his annual report.

On motion of BRIG. GEN. J. T. PRIESTLY, Iowa, the report was adopted and ordered placed on file.

LIEUT. H. A. ARNOLD, Pa., Treasurer, presented his annual report.

MAJ. T. C. CLARK, Minn., moved that the report of the Treasurer be referred to the Auditing Committee.

COL. R. H. REED, Wyo.—I wish to make a few remarks right here in regard to this matter of dues for 1898. It was decided at Kansas City that we would collect dues for the year in which we had no meeting. It is presumable that men who were there and voted on the motion were willing to pay their dues that year, but there was a great body of men who were not there. Quite a large proportion of those members would not have agreed to that proposition, and I would suggest that

the Auditing Committee be instructed to bring in a recommendation in regard to the dues of 1898. I think if we take into consideration the fact that many men were unable to pay dues that year we shall look at this matter in a different light. I would suggest that those men who paid their dues in 1898 be credited with them, and that those who have not paid them be relieved from the payment of dues for that year. We have money in the treasury, and those men cannot see just why the dues of that year should be collected, and I am convinced that one reason why there are so many delinquents is the fact of the non-payment of dues for that year. In the motion to refer to the Auditing Committee I would suggest that there be included an instruction to canvass the subject and bring in a recommendation regarding that matter.

LIEUT. COL. J. D. GRIFFITH, Mo.—May I amend that motion by asking that the Auditing Committee do not report at present; I mean until probably the last business meeting. There are several things which should properly come up in the recommendations from this committee that I think should be very thoroughly discussed here, especially so since a great many changes may be made in our by-laws which could be included in the Auditing Committee's report. For this reason I would like to have the report of the Auditing Committee deferred as late as possible. I offer this as an amendment to Maj. Clark's motion.

The amendment was accepted by Maj. Clark.

The motion of MAJ. CLARK as amended was then put to a vote and unanimously prevailed.

LIEUT. COL. CHAS. ADAMS, Chairman, submitted the report of the Publication Committee.

On motion of COL. R. H. REED, Wyoming, the report was received and adopted.

MAJ. A. H. BRIGGS, Chairman, presented a report on behalf of the Committee on Transportation.

On motion of COL. R. H. REED the report of the committee was received and adopted.

LIEUT. COL. ADAMS, Secretary, reported that no papers

had been presented in competition for the Enno Sander prize and consequently there would be no award.

The report of the Journal Committee being next in order, the President announced that at the last moment Col. Shoemaker, the Chairman, found it impossible to be present at the meeting, and directed that the next member in order act in behalf of the chairman.

P. A. SURG. CHAS. P. WERTENBAKER, U. S. M. H. S., announced that as a member of the Journal Committee he was thoroughly familiar with its actions and with the work the committee had done.

On motion of MAJ. T. C. CLARK, Minn., the report of the committee was deferred until a later session.

The President appointed an Auditing Committee consisting of the following members:

Brig. Gen. J. T. Priestly, Iowa.

Maj. T. C. Clark, Minnesota.

Col. R. Harvey Reed, Wyoming.

On motion of LIEUT. COL. J. D. GRIFFITH, Mo., the President was instructed to appoint the Nominating Committee immediately upon convening of the afternoon session.

On motion of MAJ. T. C. CLARK, Minn., the meeting adjourned until 2:30 p. m.

SECOND SESSION, THURSDAY AFTERNOON, MAY 30, 1901.

The meeting was called to order by the President at 3:00 P. M.

The Executive Committee submitted a report through the Secretary, LIEUT. COL. CHAS. ADAMS.

On motion of COL. J. D. GRIFFITH, Mo., the report of the committee was received.

On motion of MAJ. A. H. BRIGGS, N. Y., the report was adopted as read.

The Executive Committee having recommended that Dr. Christian Fenger, of Chicago, be made an honorary member of the Association, on motion of MAJ. A. H. BRIGGS, N. Y., the rules were suspended and the secretary instructed to cast

the unanimous ballot of the Association in favor of Dr. Fenger as an honorary member.

The business of the afternoon session being concluded, the literary program was taken up with a paper on "A Plea for Immediate Coeliotomy in Perforating Gunshot Wounds of the Abdomen in War," by CAPTAIN CHARLES E. B. FLAGG, Asst. Surg. U. S. A. In the absence of Capt. Flagg the paper was read by Lieut. Col. John Van R. Hoff.

The paper was discussed by Lieut. Col. J. D. Griffith, Lieut. Col. R. J. Fitz Gerald and Lieut. Col. J. V. R. Hoff.

A paper upon "Suprapubic Operation for Varicocele and Other Conditions Occurring within the Scrotum Requiring Surgical Interference," was read by MAJ. A. E. BRADLEY, Medical Department, U. S. A. The paper was discussed by Major T. C. Clark, Lieut. Col. J. D. Griffith, Col. E. W. Lee, Gen. F. W. Byers, Col. R. H. Reed, Lieut. R. K. Hutchings, Lieut. Col. J. V. R. Hoff, Major Geo. Halley, P. A. Surg. C. P. Wertebaker, Gen. J. T. Priestley and Dr. Ch. Fenger.

THE PRESIDENT.—We have present with us a gentleman whom in honoring by making him an honorary member of this Association you have honored yourselves, and I take great pleasure in introducing to the Association of Military Surgeons, Prof. Christian Fenger. (Applause.)

DR. CHRISTIAN FENGER.—Mr. President and Members of the Association of Military Surgeons of the United States: I wish to say, that I feel very keenly the honor you have just conferred upon me. My love for military surgeons is an old one; it is over thirty-six years old, inasmuch as the first war I participated in was in 1864. It did not take long for me, as well as everybody else, years before I came over here to be one of you, to have my admiration aroused for what military surgery in America had done, for the record of the War of the Rebellion towers far above anything that has heretofore been written as a record of military surgery. It stands as a model for the admiration of all. As a consequence I feel still more deeply the honor and satisfaction to be allowed to take a part in the deliberations and to be made a fellow of the Associa-

ation of Military Surgeons of our country that has done the best work in that line that has ever been done. Gentlemen, I thank you. (Applause.)

On motion of MAJ. T. C. CLARK, Minn., the announcement of the Nominating Committee was postponed until the first order of business of the Friday morning session.

On motion of COL. R. H. REED, Wyo., the meeting adjourned until Friday morning at 10 o'clock.

THIRD SESSION, FRIDAY MORNING, MAY 31, 1901.

The Association was called to order at 10:15 A. M. by the President.

The President announced as the first order of business under the resolution of the previous session the announcement of the apportionment of votes for members of the Nominating Committee from different states.

The apportionment was then read by the Secretary.

APPORTIONMENT OF VOTES TO THE STATES AND SERVICES REPRESENTED BY ACTIVE MEMBERS PRESENT AT THIS MEETING.

	Members.	Votes.
Army	75	8
Colorado	6	1
Connecticut	13	2
Illinois	26	4
Iowa	7	2
Marine Hospital Service	12	2
Massachusetts	18	3
Minnesota	13	2
Missouri	14	2
Nebraska	4	1
New Hampshire	2	1
New Jersey	9	1
New York	33	4
North Dakota	1	1
Pennsylvania	35	4
Rhode Island	13	2
" Wisconsin	8	2
Wyoming	1	1

The Committee on Necrology through its Chairman, BRIG. GEN. GEO. COOK, New Hampshire, submitted a report.

On motion of COL. J. D. GRIFFITH, Mo., Gen. Cook was instructed to continue the necrological report, and, within sixty days of the adjournment of the Association, to place the completed report in the hands of the Secretary for publication in the proceedings.

At the request of the President MAJ. A. H. BRIGGS, N. Y., took the chair.

The literary program was resumed by the reading of a paper upon "Observations in China and the Tropics on the Army Ration and the Post Exchange or Canteen," by MAJ. LOUIS L. SEAMAN, U. S. V. E.

The reading of the paper evoked a very animated and lengthy discussion, participated in by Col. W. W. Grant, Col. R. H. Reed, Gen. F. W. Eyers, Licut. Col. J. D. Griffith, Maj. T. C. Clark, Maj. Geo. Halley, Maj. A. A. Wesley, Lieut. Col. J. V. R. Hoff, and Gen. Geo. Cook.

MAJ. T. C. CLARK, Minn., moved that the paper be referred to the Publication Committee, and it was so ordered.

MAJ. L. L. SEAMAN then presented the following preamble and resolution relative to the subject:

Whereas, the Association of Military Surgeons of the United States now in session at St. Paul, recognizes that the abolition of the Army Post Exchange or Canteen has resulted, and must inevitably result, in an increase of intemperance, insubordination, discontent, desertion and disease in the Army, Therefore, be it

Resolved, that this body deplores the action of Congress in abolishing the said Post Exchange or Canteen, and, in the interests of sanitation, morality and discipline, recommends its reestablishment at the earliest possible date.

After an extended and thorough discussion the resolution, on motion of MAJ. T. C. CLARK, Minn., was unanimously adopted.

COL. R. H. REED, Wyoming, submitted the following supplementary resolutions:

Resolved, That it is the sense of this Association to resolve its members in each state into a special committee to confer with their congressional representatives and senators and interest them in the repeal of the so-called "canteen law."

Resolved. That a committee of seven, representing the U. S. Army, the Navy, the Marine Hospital Service and the members of this Association, be appointed to confer with a committee from the House of Representatives and Senate in reference to the matter.

The President, GEN. A. J. STONE, resumed the chair.

COL. R. H. REED, Wyo., moved the adoption of the resolution.

BRIG. GEN. GEO. COOK, N. H.—In the interest of combining effort I would suggest that the resolutions be referred to the committee on national legislation which is auxiliary to the American Medical Association, and which will meet in Washington and have charge of all such matters.

COL. R. H. REED, Wyo.—I will be very glad to accept the suggestion of Gen. Cook and add to the resolution:

Resolved, That a copy of this resolution be sent to the Committee on National Legislation of the American Medical Association and with a request to cooperate with us, and

Resolved, That a sufficient number of copies of the paper be printed to furnish a copy to each representative and senator, and that a member of the association shall be designated to see that the copies are properly distributed.

GEN. J. T. PRIESTLEY, Iowa.—There is only one objection to the committee proposed under Col. Reed's resolution, it is too large. A committee of seven is much more unwieldy than a committee of three or four. You can do much more work with a smaller committee.

COL. R. H. REED, Wyo.—I have no objection to cutting it down. I will make the number three.

MAJOR L. L. SEAMAN, U. S. V. E.—If it meet the approval of this Association I would suggest that this same resolution be presented to the American Medical Association for their approval with the endorsement of this Association.

LIEUT. COL. JOHN VAN R. HOFF, U. S. A.—There is one question I would like to ask in regard to the resolution introduced by Maj. Seaman. If, by a peculiar combination of circumstances, the American Medical Association should refuse to pass that resolution what would be our status in regard to the joint action between the committee and the committee on legislation? It is safe to assume that they will pass it, but we have no alternative.

COL. R. H. REED, Wyo.—It is not the idea that we are to

act conjointly; we simply ask them to "cooperate with us." We have passed our resolution, we stand on record, but we simply ask them to act with us on the same measure. Our idea is to have the committee appointed and act with the committee from the House and Senate. Of course, if the committee on legislation of the American Medical Association cooperate with us we would act together with those committees. If they refuse to act with us our committee will act with the committee of the house and senate the same as though the other committee had not been asked to cooperate with us.

A vote being taken the resolutions offered by Col. Reed were unanimously adopted.

The President appointed as additional members of the Journal Committee:

Brig. Gen. J. T. Priestley, Iowa.

Maj. T. C. Clark, Minnesota.

Lieut. Col. Joseph K. Weaver, Pennsylvania.

On motion of MAJOR GEO. HALLEY, Mo., the association adjourned until 2:30 P. M.

FOURTH SESSION, FRIDAY AFTERNOON, MAY 31, 1901.

The Association was called to order at 3 P. M. by the President.

The Committee on Journal reported through P. A. SURG. C. P. WERTENBAKER, U. S. M. H. S., who acted in behalf of the chairman of the committee, that after having various propositions submitted the committee recommended that the publication of a journal at this time would be inexpedient.

LIEUT. COL. J. D. GRIFFITH, Mo., moved that the report be received and accepted.

LIEUT. COL. J. D. GRIFFITH, Mo.—At the meeting a year ago, if you will refer to our proceedings you will notice that I spoke of the fact of the completeness of the volume as it is today. It is now an integer of your library from the first down to the present. It should be continued so, and as such it should be published at a nominal price,—I do not know what, say 75 cents, \$1.00 or \$1.50, whatever it costs to bind

it. But I do not like this idea of making either a monthly or a bi-monthly journal; a copy is liable to be lost and then what are you going to do? Now there are many things to be considered. We need a permanent secretary. We need a monthly journal. We need the proceedings in volume form. I do not know that there is a man within the sound of my voice that would not want one for his library, even though he does have every magazine and journal that comes out. So when I spoke a year ago at New York I said the same thing I say now: Let us have a monthly journal, a bi-monthly journal, or whatever this committee may recommend, but let us have the journal in a volume as before.

MAJ. T. C. CLARK, Minn.—This committee had presented to it certain propositions from different parties in regard to publishing the journal, which is the last of the subject under consideration from the standpoint of practicability. To make a journal a success would necessitate having its editor not only competent for the position, but easy of access to the point of publication. For instance, it has been suggested that a good editor might be secured and a permanent secretary who lives in a small town in Pennsylvania, and a very flattering proposition came to us for publishing a journal within a very few miles of this city. In case such a secretary be selected, having the editor of the journal and the publisher separated a thousand miles more or less would make it difficult to publish a journal under such circumstances. If a good, competent editor could be selected near the point of publication, within easy access of the publishing house it would make the project much easier to carry out. This committee thought it best to present its views in these resolutions which could be adopted or rejected, as the Association sees fit. We realized the fact that some means of communication between the Association and its members is necessary at an earlier date than is now provided by the volume of transactions. A pamphlet issued immediately after the close of the session containing a list of the officers for the ensuing year, a list of committees and other matters of interest in the line of acquainting the

members with what has been done would be very desirable, and it would go very far towards awakening the interest of non-attending members. During the year pamphlets could be issued showing the applications for membership, etc., and keeping the members in touch with the Association, and such circulars could be sent to non-members and thus awaken in them an interest. It would save the secretary a vast amount of work and inconvenience, because it will furnish the information many members write to him to get. This committee when we came to consider this matter did not feel in the absence of the knowledge of a man, a practical man for such a position and so situated that he could look after the interests of a journal, as though they were authorized to advise such a course, and they have therefore presented the subject in such a way that the views of the members could be obtained. We thought a trial for a year of this form, which would be an innovation, would put us in position to see whether this would cover the ground, and whether we should not wish another year to have a journal, and we considered this plan a step in the right direction. It is better to go slowly and carefully in this matter in order that we may make no mistakes.

COL. R. H. REED, Wyo.—This is a subject of great importance to this Association, and while I am not here for the purpose of advocating or discouraging the publication of a journal, I think it is well to consider this matter in all its phases. No doubt there are a number of members here who were present at the meeting of the American Medical Association when the Journal was born at Cleveland in 1882. Our proceedings had been published for years in volume form, just as the proceedings of this Association are published now, and about the time of our next annual meeting the volume would come out and would go on our shelves and many of the members would never read it. The question of publishing a journal came up, and it was a hard fought battle, but it was carried in favor of a journal. The Journal for some time after it was issued was an expense to the Association, but it is not an expense to the Association to-day; it is a means of revenue.

However, we could not well apply the same thing to this Association because we do not have the members to draw from, hence I think the action of the committee as expressed in the report was wise. We came here to this meeting and found one or two papers on the program instead of ten or a dozen as we had reason to expect. There have been some volunteer papers to help us out. Some of us have come fifteen hundred miles for the purpose of attending this meeting and I feel that we ought to have more literary work on our program than we have at this meeting. A number of writers do not care to furnish papers because they know they will be hid away a year or more and then come out in a volume where no body sees them. By that I mean the general practitioner who is interested in this kind of work, and in order to get it before them promptly the only way to do is to do it by some journalistic method. The question is what method is the best. We write our papers and read them here. They will come out a year from now in the volume, and it may be that the editors of a few journals will review it, and then it goes on the shelf as dead matter except to a few of us. What is the best method to pursue by which to obtain the best talent to write papers? We have offered a prize during the past year for papers. Did we get any? Not one paper. And I believe the cause lies in the fact that our proceedings do not get before the profession in the way they should. I believe there is room for improvement in this direction, and I believe the sooner we get down to some method to get our papers before the reading profession the sooner we shall get good papers and more papers by the best talent. This may be a good plan for another year, but I believe we have to definitely come to an understanding with some journal that is competent to spread the work before the reading profession of the United States and get it out in that form, and then have our volume succeed that in the same size and form in which it is published today. That can easily be done. We can get the journal very easily if we give it to them as first class matter, original matter, and afterwards put it in the form of a volume to put on our shelves.

While I am ready to vote for the resolution offered by this committee, I think it is a questionable procedure as a permanent matter. I am willing to vote for it as a temporary expedient, but we must get the best talent obtainable and use the best means possible to get it promptly before the reading profession.

P. A. SURG. C. P. WERTENBAKER, U. S. M. H. S.—I think Col. Reed's suggestion is a very good one, but I only want to call attention to the fact that in the meantime, until we can get a journal or publication of our own, we can always give our papers to various journals in different parts of the country, and they will be only too proud to publish them as original matter, and they can afterwards be published in our proceedings. I read a paper before the Association last year and it was published in two journals, one of them here in St. Paul and another on the Pacific coast, and I was furnished reprints from both publications. Any member who has a paper before the Association can do the same thing, the journals will be only too glad to receive it. Until we get a journal of our own, any member who is desirous of having his paper published can have it done, and I know the editor of any journal will take great pleasure in receiving it.

LIEUT. COL. JOHN VAN R. HOFF, U.S.A.—I am impressed with the idea that the matter under discussion is of the utmost importance to this association. I let my mind run back to the meeting of the Association held in Washington in 1894 where this very matter was under discussion, and where, after very careful consideration having been given to it by the committee appointed for that purpose, it was decided that then the time was not ripe and we would proceed as we had theretofore. Eight years have passed, and during those eight years there has occurred a war, and in that war there must have been no less than two thousand physicians engaged as medical officers. How many of those physicians are members of the Association of Military Surgeons? And why are they not members of the Association of Military Surgeons? How many of them if they were members could come here to these meetings?

We must have some means of addressing a very important constituency that properly belongs to us and with which we do not come in contact at all. We have five, six or seven hundred officers in the Philippines today, and I do not believe seven of them are members of this Association. We had hundreds of medical officers in the South during the Spanish war, in Cuba and Porto Rico. How much of the experience they have gained have we got in our Association today? All the papers we have got from such experience we could count on the fingers of one hand. There must be some radical change or this Association will cease to exist. We must have some way of addressing these people. What is the way? Through the instrumentality of your already established journals that will reach these people? Now I feel, and perhaps I am wrong, there is one remedy I have to suggest for a condition which seems to me to need a remedy. I believe the time has come, and the Association is today in position, as far as its finances are concerned, to start its own journal. If we wish to preserve the annual proceedings in volume form it is merely a question of sending out our journals to the book-binder and putting them on our shelves. Of course the United States is full of periodicals which would be pleased to publish our papers. Only a few days before I left Washington I had a letter from Gen. Rodenbough who asked me to see the writers of papers at this meeting and induce them to send the papers to him that they might be published in his journal (*Journal of the Military Service Institution of the United States*). If we do that we approximately get closer to our people who are now in the service than through any other existing instrumentality. That is not the point. We want these men to belong to us. We want this Association to be the connecting link between professional and civil life, between professional and military life. We want these men who have been both military officers and members of the profession in private practice to give their experience to people in civil practice so that they may know it requires more than a good general practitioner to become a good medical officer. The only way

we can do this is to get the people interested in this organization to use their influence in favor of this institution. I am in favor of a journal. If there is any other remedy, all right. The plan suggested by Major Clark is all right. At the time we held our convention at Columbus there were quite a number of notices to members, constitution, lists of members, etc., issued. That is what I understand Major Clark suggests. That was very well, but it did not get at the heart of the thing. The heart of the thing is to get hold of these men. We are an institution of three or four hundred members. We have a delinquent list that is appalling. We are going to lose the delinquent list. Instead of losing members, we want to gain members. Instead of a little list of three or four hundred we want three or four thousand members. We must do something to effect a change in this direction or we must soon go out of existence. (Applause.)

MAJ. T. C. CLARK, Minn.—I must ask the President to be permitted to speak again if there is no objection. I do not think any member of the committee or any member of the Association denies Colonel Hoff's assertions. That is a point that is admitted by all. The point of view the committee takes is from a business standpoint. Until this Association has some permanency of organization, until it has some central point where its records can be kept, until it has an organization which shall be able to perpetuate what has been done here and carry it through to the next meeting, and which can only be done through the election of a permanent secretary and the appointment of one committee which shall have charge of the work that has been done, we cannot hope to successfully publish a journal. You may have had great interest, you may have had a large and enthusiastic meeting a year ago today, and a year from now we may be dead, and we may not have a program as we did not have at this meeting. You may have \$5000 in the treasury today, and in a year or two you may be \$1000 in debt if you publish a journal. As soon as we get a permanent organization which can be perpetuated it will be safe to advocate the establishment of a journal.

The committee took the view that the first step necessary should be the election of a permanent secretary, a man with full knowledge of what is being done in this Association, who knows all the members, who knows how to select the working members to suggest to the president that he may select his committees. When you have a business organization to do business in a business way and you establish a journal it may be a success. The committee viewed this matter from the business man's standpoint, and it is for the best interests of the Association that until we get on a sound business basis it is not wise to establish a journal. When you establish a permanent secretary that is the first step. Then appoint a Literary Committee who will come to these meetings and make their report. It has been years since a committee came up here and made a complete report. We have got to get on a business basis first and then we can publish a journal.

LIEUT. COL. JOHN VAN R. HOFF, U. S. A.—Then I think we had better get there quick.

COL. R. H. REED, Wyo.—I just want to say one word if there is no objection. I am in favor of a permanent secretary, but I want to say right here that the best secretary on earth cannot supply the talent we need in the Association. He cannot edit a journal unless he has the material to edit it with. That is the very point we are getting at, to present a plan for this Association to work under, to bring in something that editors can edit, and the sooner we can get at it the better.

LIEUT. COL. J. D. GRIFFITH, Mo.—What the committee suggests amounts to the same thing as a journal; it leads up to that.

A vote being taken on the motion offered by Col. Griffith, the report of the Committee on Journal was received and accepted.

Under the literary program the first paper read was by SURG. GEORGE TULLY VAUGHAN, U. S. M. H. S., on the subject of "Three Noteworthy Cases of Brain Injury."

The paper was discussed by Lieut. Col. Griffith, Col. Grant, Maj. Halley and Col. Reed.

On motion of P. A. SURG. C. P. WERTENBAKER, U. S. M. H. S., the paper was received and referred to the Publication Committee.

DR. CHRISTIAN FENGER, of Chicago, formerly Assistant Surgeon in the Danish Army, was then introduced by the President and, upon invitation, made some interesting remarks upon "Secondary Hemorrhages."

On motion of LIEUT. COL. J. D. GRIFFITH, Mo., the address of Dr. Fenger was received and referred to the Committee on Publication.

LIEUT. COL. JOHN VAN R. HOFF spoke briefly on the subject of the "Regimental Field Equipment of the Medical Department of the Regular Army, Model of 1901," which he demonstrated to the Association.

On motion of COL. R. H. REED, Wyo., the discussion of Col. Hoff's remarks was postponed until the following session.

The Secretary, LIEUT. COL. CHAS. ADAMS, then announced the names of the members of the Nominating Committee as follows:

NOMINATING COMMITTEE.

Maj. Richard, U.S.A.
Maj. Root, N.G. Colo.,
Maj. Watson, N.G. Conn.,
Maj. Wesley, I.N.G.,
Maj. Wright, Ia.N.G.,
P. A. Surg. Wurtenbaker, U.S.M.H.S.,
Gen. Blood, M.V. M.,
Col. Fitz Gerald, N.G., Minn.,
Maj. Halley, N.G. Mo.,
Col. Evans, N.G. Neb.,
Gen. Cook, N.G.N.H., Chairman,
Col. Myers, N.G.N.J.,
Maj. Briggs, N.G.N.Y.,
Col. Archibald, N.D.N.G.,
Col. Weaver, N.G. Pa.,
Col. French, R.I.M.,
Maj. Evans, Wis.N.G.,
Col. Reed, N.G. Wyo.

LIEUT. COL. J. D. GRIFFITH, Mo., announced that he would make a motion for a change of the by-laws relating to the transactions.

On motion of LIEUT. COL. J. D. GRIFFITH the Association adjourned until Saturday morning, 10 o'clock.

FIFTH SESSION, SATURDAY MORNING, JUNE 1, 1901.

The Association was called to order by the President at 10:15 A. M.

In accordance with the resolutions consequent upon Maj. Seaman's paper, and which were adopted at a previous session, the President appointed the following committee to carry out the provisions of the resolutions relative to the Army Canteen:

Brig. Gen. Geo. Cook, New Hampshire.

Brig. Gen. J. T. Priestley, Iowa.

Col. Robert H. Reed, Wyoming.

Lieut. Col. J. D. Griffith, Missouri.

Major T. C. Clark, Minnesota.

Major Louis L. Seaman, New York.

Major Arthur L. Wright, Iowa.

Pursuant to a resolution passed at the previous session the discussion of Col. Hoff's remarks on the "Regimental Field Equipment of the Medical Department of the Regular Army" was then taken up.

At the request of the President, BRIG. GEN. GEO. COOK took the chair.

The literary program was resumed with a paper on "The Pennsylvania Brigade Hospital Tent," by LIEUT. H. A. ARNOLD, Asst. Surg. N. G. Pa.

The paper was briefly discussed.

On motion of LIEUT. COL. JOSEPH K. WEAVER, Pa., the paper was received and referred to the Publication Committee.

The second literary number on the program was an address by LIEUT. COL. J. D. GRIFFITH, Mo., on "Some Points in Military Surgical Practice."

The subject matter of the address was discussed by Col. Grant, Col. Reed and Lieut. Col. Marcy.

During the discussion the Chairman introduced to the Association LIEUT. COL. HENRY O. MARCY, of Boston, who responded briefly.

On motion of COL. W. W. GRANT, Colo., the address of Lieut. Col. Griffith was referred to the Publication Committee.

The Secretary, LIEUT. COL. ADAMS, submitted the report of the Executive Committee. On motion of LIEUT. COL. J. D. GRIFFITH, Mo., the report was received and accepted.

The Auditing Committee, through its chairman, BRIG. GEN. J. T. PRIESTLEY, Iowa, presented its final report.

On motion of LIEUT. COL. JOS. K. WEAVER, Pa., the report of the committee was adopted.

MAJ. T. C. CLARK, Minn.—There was a recommendation in the report which was not specific, and in order to give it force I will move that the Treasurer be authorized to employ such assistance as may be necessary so as not to interfere with his own business. Our experience with Treasurer Arnold has been such that we know we can trust him, and I will audit every bill that he brings in. I move you that the treasurer be empowered to employ any assistance he may find necessary in the conduct of his affairs.

The motion was numerously seconded and, being put to a vote, unanimously prevailed.

The report of the Nominating Committee was then submitted by its secretary, MAJOR CHARLES RICHARD, U. S. A.

LIEUT. COL. J. D. Griffith, Mo., moved that the report be adopted and that the gentlemen nominated be declared elected as officers of the Association for the ensuing year.

MAJOR T. C. CLARK, Minn.—The report of the committee contained two recommendations, one nominating the officers for the ensuing year and the other referring the time and place of meeting to the incoming Executive Committee. If the motion is intended to simply include the indorsement of the officers nominated I will vote for it, but if it also includes the time and place of meeting I would like to separate it.

COL. R. H. REED announced that with the consent of the

second he would divide the motion and move to adopt the recommendation relating to the election of officers.

LIEUT. COL. WEAVER, the second, consented to the division, and the motion being put to vote the officers nominated were declared unanimously elected as follows:

President.—Lieut. Col. JOHN VAN. R. HOFF, U. S. A.

First Vice President—Brig. Gen. ROBERT A. BLOOD, M. V. M.

Second Vice President—Gen. WALTER WYMAN, U. S. M. H. S.

Secretary—Major JAMES EVELYN PILCHER, U. S. A.

Treasurer—Lieutenant HERBERT A. ARNOLD, N. G. Pa.

The President asked President-elect Lieut. Col. Hoff. to take the chair, and midst enthusiastic applause presented him to the Association with the following words:

Members of the Association of Military Surgeons:

Nothing that has happened to me during my connection with the Association of Military Surgeons has given me greater pleasure than to introduce to you the gentleman you have chosen as my successor, LIEUT. COL. JOHN VAN R. HOFF, of the United States Army. (Applause.)

The President-elect, LIEUT. COL. JOHN V. R. HOFF, responded as follows:

Comrades: A lady was passing through the wards of an overcrowded military hospital when she suddenly encountered two men sawing and hammering on some boards. She looked at them in some surprise and wonderingly asked:

“What are you doing there, my men?”

They looked up at her and one of them said:

“What are we doing? Why, we are making a coffin, that's what we are doing.”

“A coffin?” she asked. “For whom are you making a coffin?”

“For that fellow over there in that bed. Don't you see him?”

The lady looked in the direction indicated and saw a man apparently in good condition and watching the operation with great interest.

“Why, that man is not dead, and indeed he does not look

as if he were going to die. Can't you postpone this work?" she asked.

"No," the men said, "we can't postpone it. The doctor told us to make the coffin and he knows what he gave him." (Great laughter.)

Gentlemen, you know what you have given me. You have given me a position of the greatest honor, a position that I have had an ambition when my turn came some time to fill, but a position which I conceive to be fraught with the greatest responsibility. These responsibilities you must help me to meet. The president of this Association is not the Association; every member has his work to do; every member should be willing to do that work, and you may be sure, gentlemen, that so long as I have the honor of presiding over the Association of Military Surgeons you will not lack for work. (Applause.)

The Assistant Secretary; LIEUT. S. C. STANTON, Ill., presented the following resolutions:

Resolved, That the Association extend to its retiring President, Brig. Gen. Alex. J. Stone, its appreciation of the able manner in which he has performed his duties.

Resolved, That the thanks of this Association be extended to the medical profession and citizens of St. Paul and especially to His Excellency Governor S. R. Van Sant of Minnesota for the courtesies shown the Association.

Resolved, That the thanks of this Association be extended to the management of the Hotel Ryan for head-quarters furnished during this meeting.

Resolved, That the thanks of this Association be extended to the officers and ladies at Fort Snelling for entertainment provided for the Association.

On motion of LIEUT. COL. J. D. GRIFFITH, Mo., the resolutions were unanimously adopted.

LIEUT. COL. J. D. GRIFFITH, Mo.—I want to offer an amendment to your By-Laws which will interest you exceedingly, and that is to amend Sec. 3, Art. VI, to read as follows:

"The Chairman of the Literary Committee shall be responsible for the program for the ensuing meeting."

I wish to make the chairman responsible for the literary program. Let us have it fixed so this announcement will be made within ninety days after the adjournment of the meeting.

COL. W. W. GRANT, Colo.—Is it not assumed that the chairman is responsible for the committee?

LIEUT. COL. J. D. GRIFFITH, Mo.—I beg your pardon, yes, it is always understood, but let us have it fixed.

COL. R. H. REED, Wyo.—I rise for information. I think according to the by-law it is the duty of the committee to arrange for a program, and as I understand Col. Griffith's amendment it provides that the chairman of the committee alone becomes responsible. I also understand it is the duty of the President of this Association as well as the Secretary to solicit papers and material for the meetings of this Association. On the other hand it is the duty of the Association to lay out business for this Association. It does not debar the President or the Secretary of the Association from soliciting members to take part on the program.

LIEUT. COL. J. D. GRIFFITH, Mo.—The President is *ex-officio* member of every committee he appoints.

BRIG. GEN. F. W. BYERS, Wis.—What would you gain by passing a resolution compelling somebody to do what he does not want to do? Can we make rules compelling members to do certain work, or should they have interest enough in the work to do it without compulsion? What is the use of trying to compel a man to do something that he probably does not want to do. I am opposed to such a resolution.

MAJ. T. C. CLARK, Minn.—I wish to say for the information of some gentlemen who have been speaking here that we had an illustration of this matter at this very meeting. A chairman of a committee wrote for information to know whether he was responsible for a report from his committee. That being the committee in charge of the program for this meeting you can very readily see the position in which we were placed. After the program was prepared and only five papers were provided the chairman asked whether he was responsible for the program.

THE PRESIDENT.—I think Col. Griffith fully understands that under the constitution this amendment can be voted upon only at the next annual meeting.

LIEUT. COL. J. D. GRIFFITH.—Then I will ask that this go over until the next annual meeting. It is an exceedingly important matter and it should be the duty of every member to try to remedy this matter. Not only that, Mr. President, but I will submit a further amendment to the by-laws, that:

The Literary Committee shall assist the Publication Committee in the prompt publication of the Proceedings.

The President instructed the Secretary to make a record of the proposed amendments.

MAJOR A. H. BRIGGS, N. Y.—Those of you who attended the meetings of this Association in 1899 and 1900 will remember a very pleasant gentleman who represented the British army, Col. McWatters. I received a letter from him a short time ago telling me that he has been awaiting orders expecting to be sent to this meeting, but he concludes that the war in South Africa has probably pigeon-holed the order to send him here, but he wished me to extend his hearty greeting to this Association and wish them Godspeed in their work, and he regrets exceedingly the lack of orders that would bring him here.

THE PRESIDENT requested Maj. Briggs on behalf of the Association to thank Col. McWatters for his good wishes and to express its regret at his inability to be present at the meeting.

MAJ. T. C. CLARK, Minn.—The reason I wished to bring up separately the recommendations of the Nominating Committee was because we usually have some invitations presented to the Executive Committee and I wish to inquire whether any such invitations have been presented. The city that has to entertain this Association has men in it who are responsible for the work and they need all the backing they can get, and they want all the help we can give them by having the matter discussed here. I know the matter has been talked of from the beginning that Boston never had a meeting, that New England never had a meeting, but I deem it better that there be an invitation and that it be discussed with the gentleman who presents the invitation.

BRIG. GEN. R. A. BLOOD, Mass.—We should be very glad to have you come to Boston next time. (Applause.) We will do the best we can to give you a good time and show you everything we have there. We have good hotels, we have beautiful parks and a great many things that would interest you and we will do all we can to make it pleasant for you.

LIEUT. COL. J. D. GRIFFITH, Mo., moved that the Association hold its next meeting in Boston.

MAJ. A. H. BRIGGS, N. Y.—Rising to second that motion I wish to say, the reason the Nominating Committee left that matter as it was, was if possible to allow this Association to follow or immediately precede the American Medical Association. I think, however, it is impracticable for this small Association to follow after that great Association. They may go to Denver or even to San Francisco and it would be impossible for this Association to follow to those points. I think whenever it is convenient we should follow close up to the American Medical Association, but now comes the time for us ourselves to select the place of meeting in the hope that the American Medical will go to Boston next year. Therefore I heartily second the motion made by Col. Griffith that we accept the invitation to go to Boston for our next meeting.

P. A. SURG. C. P. WERTENBAKER, U. S. M. H. S.—I think, gentlemen, it would be very well to go a little slow in this matter of making a selection of a place of meeting. In the first place, last year the Association met in New York City. It has met in Philadelphia; it has met in Washington, Buffalo and other large eastern cities, and if you continue to go to the large cities, cities like Boston, New York, etc., we are very small potatoes in a great big row, whereas, if we go to the smaller cities we will there receive, as we have received here, a great deal of attention. [MAJ. CLARK: This is not a small city.] [Laughter.] What I want to call your attention to, is this: This Association has never met in the south except in Kansas City once. There is a large number of officers in the south who could be brought into the Association if the Association would come anywhere near their territory. I un-

derstand the president of the Association wrote to the various governors asking that they make details to this meeting. I know in Louisiana, where I am now stationed, a number of officers were detailed, and yet they were unable to afford the expense of coming up here and going back again. I have heard that it is possible that the American Medical Association will go south next year. It seems to me that if we could have a meeting place somewhere in the central south, like Memphis, Atlanta or New Orleans, it would be very much better for the Association. We would gather a large number of members in. We would get many in the south and west that would not take the long trip up to Boston. I think it was for that reason it was recommended in the committee that the whole matter be referred to the Executive Committee and allow them to determine the place of meeting later on. I think that would be a wise thing to do in the end, as the Executive Committee can determine that matter better than we can today.

COL. W. W. GRANT, Colo.—It gives me pleasure to second the suggestion of my friend on the right. I think six months from today the Executive Committee can determine the place of meeting better than we can today. I believe it better to adopt the recommendation of the Nominating Committee and leave the matter with the Executive Committee. They have communication with civil and military life and they will know just what is best to do. So far as the American Medical Association is concerned, that we ought to immediately precede or follow them, I doubt whether that is an opportune time to meet. That has been practically settled because of its encroachment upon Memorial Day. I would therefore move that the report of the Nominating Committee be adopted as a substitute to the motion providing for a meeting in Boston.

The motion was numerously seconded.

MAJ. T. C. CLARK, Minn.—I have no objection to the report of the Nominating Committee or to that theory, but I am a practical man, and if we receive an invitation from a certain city it means that there are some men back of it who will look

after the Association when it gets there. When men come here year after year from states where they can get no medical men into the Association and this committee sees fit to pick out some city in some section of the country that is nice, and then we go to that city and find no man who is familiar with the work of this Association it means that there is going to be a pretty sad time for somebody in that town. On the other hand, an invitation coming from some city is generally backed up by public sentiment in that city and enables them to provide for a successful meeting. Of course, there would be no difficulty to pick out a desirable section to go to, but it is my experience that you have got to have the public sentiment of the city or the medical department of the state back of the city that entertains the Association.

P. A. SURG. C. P. WERTENBAKER, U. S. M. H. S.—If that is all there is lacking I will promise him invitations from a half dozen cities south of the Mason and Dixon line.

A vote being taken on the substitute motion of Col. Grant, the recommendation of the Nominating Committee placing the selection of a place of meeting in the hands of the Executive Committee, was adopted.

There being no further business to come before the Association the President declared the tenth annual meeting of the Association of Military Surgeons of the United States adjourned *sine die*.

CHARLES ADAMS.

Secretary.

Reports of Officers and Committees

REPORT OF THE SECRETARY.

THE Secretary has the honor to report that since the meeting of the Association in New York in 1900 we have suffered loss of membership, by death ten (10) and by resignation nine (9). Many names have been dropped from the rolls for non-payment of dues. Although blank applications for membership have been extensively circulated in the various services only seven applications have been made.

In exchange for the Transactions of the Association, the British Medical Journal, a List of the Medical Officers of the Swedish Army, and the Transactions of the Medical Societies of Rhode Island and Texas have been received and are now in the office of the Secretary.

Respectfully submitted,

CHARLES ADAMS,

St. PAUL, May 30, 1901.

Secretary.

REPORT OF THE TREASURER.

THE Treasurer has the honor to submit the following report of an office happily relieved of the embarrassment of a condition of impecuniosity. My tribulations consequently were few, and may be briefly stated.

One of the difficulties incurred in the interim during which we had no meeting was the fact that the dues went on, and many members felt they were getting no benefit from their membership; the Treasurer has received numerous complaining letters, and the arrearages of dues amounted to considerable. During the past two years it has been the task of the treasurer to mollify the members three, four, or even five years in arrears. In carrying them on the books this long I will say I felt that I was not violating the spirit of the article providing for the dropping of delinquents, and as a reward for the retention of such members I received from a number \$20. from some \$15, and I felt that this meeting would also result in the payment of dues in similar amounts by such members.

I come to this meeting with six life members.

One member paid in advance.

162 members fully paid.

120 owing \$5 each.

20 owing \$10 each.

76 owing \$15 each.

66 carried on the books owing \$20 each.

25 carried on the books owing \$25 each.

In explanation of the fact that these have been carried I will say that it is partly owing to the changes that have taken place in consequence of the Spanish-American war. Likewise owing to the election of new Governors in the various States, and consequent changes in the medical departments of the different national guards. Some have become disinterested, and some, through pecuniary sacrifice during the Spanish war, have stated their inability to pay at the time, but have expressed a desire to remain on the books and promised payment in the future. Some of the promised payments are now materializing.

REPORT OF RECEIPTS AND EXPENDITURES

From May 29, 1900 to May 26, 1901.

RECEIPTS.

Cash on hand May 29, 1900	- - - - -	\$3229.79
Received from sale of Proceedings	- - - - -	11.50
" " Application fees	- - - - -	140.00
" " Dues	- - - - -	1565.10
" " Sale of Insignia	- - - - -	236.00
Interest on Deposits	- - - - -	83.66
		<hr/>
		\$5266.05

DISBURSEMENTS.

For Postage and Internal Revenue Stamps	- - - - -	\$ 25.20
" Printing	- - - - -	13.75
" Insignia	- - - - -	228.60
" Postage and Expressage, Distributing Proceedings	-	90.20
" Storage of Proceedings	- - - - -	86.25
" Application fees retained by the Secretary	- - -	105.00
" Expenses of Annual Dinner	- - - - -	52.00
" " " New York Meeting	- - - - -	7.16
" " " Literary Committee N. Y. Meeting	-	56.35
" Reporting New York Meeting	- - - - -	100.00
" Volume VIII Proceedings	- - - - -	774.70
" Freight Vol. VIII Columbus to Ardmore	- - - -	12.49
" Treasurer's Bond Renewed for one year	- - -	15.00
" Incidental Expenses	- - - - -	36.90
		<hr/>
Balance in Treasurer's hands	- - - - -	\$3662.45

There is nothing further to add except the suggestion that it might be wise to limit the number of transactions issued, owing to the bulk of material of that character now in the hands of the Treasurer. I have several tons of matter, but all of it valuable. I have supplied medical libraries, and libraries of the largest institutions throughout the country as far as they have come to my knowledge. I have also forwarded copies of the transactions to all of the more prominent medical journals of the country, and a few requests have come from foreign sources which have been complied with. We still have a great many copies of the transactions of each year to spare, with the exception of one year. The price has been

fixed very low. I do not know that it is necessary to change this rate, but if it is the pleasure of the Association to dispose of these copies, the Treasurer will comply with their wishes.

The expense of printing and distributing Volume IX of the Proceedings, is the only unpaid obligation of the Association, this Volume being still in the hands of the printer.

Respectfully submitted,

H. A. ARNOLD,

Treasurer,

REPORT OF THE EXECUTIVE COMMITTEE.

THE Executive Committee presents to the Association an amendment to the Constitution as follows:

To amend Sect. 3, Art. 2, referring to Associate Members, by inserting after the words "Ex-Medical Officers of the United States Volunteer Service" the words, "and Ex-Medical Officers of the Confederate Army and Navy, whose service was honorably terminated."

This amendment was referred to the Executive Committee by a unanimous vote of the Association on June 20, 1900.

The Committee reports¹ the election of the following:

May 30, 1901.

ACTIVE MEMBERS.

Anderson, Winslow, Col. and Surg. Gen., N.G.Cal.,
Bloodgood, Delavan, Med. Dir. (Capt. Ret.) U.S.N.,
Drake, Clarence Eugene, Capt. and Asst. Surg., O.N.G.,
Evans, Carroll D., Col. and Surg. Gen., N.N.G.
Fuller, D. R., Capt. and Asst. Surg., N.G.P.,
McCormick, Louis P., Capt. and Asst. Surg., N.G.P.,
Pierce, Norval H., P. A. Surg. Lt., I.N.M.
Root, Matt R., Maj. and Surg., N.G.Col.,
Stieren, Edward, 1st Lt. and Asst. Surg., N.G.P.

¹ These names were reported upon the three days of the meeting as noted and are grouped together for convenience of reference.

ASSOCIATE MEMBER.

Fox, Charles James, Brig. Gen., Surg. Gen. (Ret.), C.N.G.;
and recommends for election as an

HONORARY MEMBER

Fenger, Dr. Christian, of Chicago, late Lt. and Asst. Surg., Danish Army.

May 31st, 1901.

ACTIVE MEMBERS.

Bentley, Edwin, Maj. and Surg. (Ret.) U.S.A.,
Davis, John S., Lt. and Asst. Surg., I.N.G.,
Dorsey, John H., Lt. and Asst. Surg., N.G.Minn.,
Fairchild, David Sturges, Jr., Maj. and Surg., N.G.Iowa,
Jacoby, William, Maj. and Surg., N.G.Minn.,
Rowe, William H., Lt. and Asst. Surg., N.G.Minn.,
Sweet, Charles F., Maj. and Surg., R.I.M.,

ACTIVE MEMBERS.

Ford, Francis C., Lt. Col. and Med. Dir., Tex. V.G.,
King, Chas. F., Capt. and Asst. Surg., N.G.Wis

ASSOCIATE MEMBER.

Marcy, Henry O., Lt. Col. and Med. Dir., U.S.V. (Civil War).

The Committee places on record for adoption at the next ensuing annual meeting the following substitutes for the sections of the Constitution and By-Laws, bearing the corresponding numbers:

CONSTITUTION.

ARTICLE II

MEMBERS.

SEC. 1. There shall be Active, Life, Associate, Corresponding and Honorary Members.

SEC. 2. Active and Life members only are eligible to office or entitled to vote.

ACTIVE MEMBERS.

SEC. 3. Active membership is limited to commissioned medical officers of

1. The United States Army;
2. The United States Navy;
3. The United States Marine Hospital Service;
4. The United States Volunteers;
5. The National Guard and other state troops; and
6. Contract or acting assistant surgeons of the United States Army, Navy and Marine Hospital Service.

Active members may retain their membership, should they be honorably discharged from the service in which they have been commissioned.

LIFE MEMBERS.

SEC. 4. Life membership and exemption from the payment of annual dues is conferred upon

1. The Prize Essayists of the Association, and
2. Any active member upon the payment of fifty dollars at one time.

ASSOCIATE MEMBERS.

SEC. 5. Associate membership is open to ex-medical officers and other officers of the aforementioned services, ex-medical officers of the Confederate Army and Navy, whose service was honorably terminated, and other persons interested in the promotion of military surgery.

CORRESPONDING MEMBERS.

SEC. 6. Corresponding membership is open to military surgeons, not resident in the United States, but prominent in military medicine, surgery, and hygiene.

HONORARY MEMBERS.

SEC. 7. The President of the United States, the Secretaries of War and the Navy, the Commanding General of the Army, and the Admiral of the Navy for the time being, are honorary members. Other persons, who have rendered distinguished service to the Association, or who have otherwise attained distinction deserving of recognition by the Association, are eligible to honorary membership.

BY-LAWS.

ARTICLE III.

MEETINGS.

The Association shall meet annually, the time and place to be fixed at each meeting for the one ensuing. Special meetings may be called by the President at any time. At the annual meeting the President, Vice-President, and Treasurer shall be elected for the term of one year, the standing committees appointed, and the annual reports received.

ARTICLE IV.

DUES AND DELINQUENTS.

The dues to be paid by Active and Associate members shall be three dollars (\$3.00) with the application for membership, and three dollars (\$3.00) per annum thereafter, due on January 1 of each year.

Delinquents in the payment of dues will not be entitled to the Proceedings or other publications of the Association. Delinquency for two years shall terminate membership, after due notice by the Treasurer.

No one formerly a member of the Association, who shall have allowed his membership to lapse by non-payment of dues, shall be reinstated before paying all arrears.

Honorary, Corresponding and Life members shall be exempt from the payment of dues.

ARTICLE V.

DUTIES OF OFFICERS.

THE SECRETARY.

SEC. 3. The Secretary shall keep the records and archives of the Association; receive all applications for membership and refer them to the executive committee; notify the Treasurer of the election of active and associate members; issue certificates of membership to active, associate, corresponding and honorary members on election, and to life members when advised by the Treasurer that the necessary fee has been paid; and shall hold office until his tenure is terminated by resignation or death, or by the election of his successor after due and timely notice.

He shall be a member and *ex officio* chairman of the Publication Committee.

He shall appoint an Assistant Secretary each year, and shall present an annual report.

THE TREASURER.

SEC. 4. The Treasurer shall receive all moneys due the Association, collect all assessments, and pay all bills which have been properly approved. He shall have charge of all publications, and distribute the same to those who are entitled to them.

The accounts of the Treasurer shall be audited by a committee appointed for that purpose on or before the annual meeting. He shall present an annual report.

He shall execute such bond of \$2,000 as may be approved by the Executive Committee for the faithful performance of his duties, the Association to bear the cost of this insurance.

ARTICLE VI.

DUTIES OF COMMITTEES.

THE PUBLICATION COMMITTEE.

SEC. 2. The Publication Committee shall have charge of the publications of the Association.

It shall determine what portions of the proceedings are of sufficient general interest to be printed, and decide upon the advisability of publishing the several papers, presented at the annual meetings, and such other matter as may be of value to the Association.

It shall prepare for publication, contract for printing, and see through the press all the publications of the Association; but all contracts for printing must first have the approval of the President and the Treasurer.

THE LITERARY COMMITTEE.

SEC. 3. The Literary Committee shall outline the literary work for the annual meeting in advance, making the necessary arrangements for the reading and discussion of papers.

The Chairman shall be responsible for the program for the ensuing meeting.

The Committee shall assist the Publication Committee in the prompt publication of the Proceedings.

CHARLES ADAMS,
Secretary.

REPORT OF THE PUBLICATION COMMITTEE.

THE Publication Committee has the honor to report that the volume of Proceedings of the Ninth Annual Meeting is completed and is in the hands of the Treasurer for distribution. The book is proportionately lighter than any previous volume and is printed on an unglazed book paper which presents the advantages of lightness in weight and a non-reflecting surface which more than compensate for the slight increase in bulk. The delay in issue of the book has been unavoidable and is due chiefly to the impossibility of securing certain papers necessary to complete the volume.

The Committee suggests, in order to facilitate its work, that a by-law be adopted which shall provide that all papers in order to be incorporated in the Proceedings shall be in the

hands of the Committee within thirty days after the adjournment of each meeting.

Conformance with this by-law would make it possible for the Committee to issue the volume of Proceedings prior to October first following.

CHARLES ADAMS,
G. W. ADAIR.
S. C. STANTON.

ST. PAUL, MINN., May 30, 1901.

REPORT OF THE NOMINATING COMMITTEE.

THE Committee met at 12.15 A. M., and organized by the election of Gen. Cook of New Hampshire as Chairman, and Major Chas. Richard, U. S. Army as Secretary. An adjournment was then taken until 4.30 P. M.

The Committee met at 4.30 P. M. and after discussion regarding the time and place for the next annual meeting passed the following resolution, viz:

Resolved, That the Committee recommends that the selection of the time and place for the next annual meeting of the Association be referred to the Executive Committee of the Association and that Memorial Day be avoided as one of the days of the meeting, if possible.

The Committee then proceeded to the election of nominees for officers of the Association for the succeeding year, and recommends the following:

For President, Major JOHN VAN R. HOFF, U. S. Army.

For First Vice President, Brig. Gen. ROBERT A. BLOOD, M. V. M.

For Second Vice President, Gen. WALTER WYMAN, U. S. M. H. S.

For Secretary, Major JAMES EVELYN PILCHER, U. S. Army, Ret.

For Treasurer, Lieut. HERBERT A. ARNOLD, N. G. Pa.

The following resolution was then unanimously carried:

Resolved, That the thanks of the Association be extended to Lieut. Col. Chas. Adams, of Illinois, for the efficient manner in which he has performed the duties of Secretary of the Association for the past two years.

There being no further business before it, the Committee then adjourned.

GEORGE COOK,

Brig. Gen. N. G. N. H., *Chairman.*

CHAS. RICHARD,

Major and Surgeon. U. S. A., *Secretary.*

REPORT OF THE COMMITTEE ON TRANSPORTATION.

I HAVE to make, simply an announcement that the meeting of the American Medical Association preceding this had secured rates, and it was with but little difficulty that we secured the same rates as conceded to them. Our rate this year is without the certificate plan, which is a nuisance and an annoyance, and I hope this Association in the future will be able to secure the same rates. The great embarrassment is to get certificates. The railroads have always required of us one hundred certificates, but never in the history of the Association did we have one hundred certificates, and it was only through the kindness of the transportation associations that we were conceded the rate. It places the committee in a very embarrassing position to have to go down on its knees and beg of them to give us the rates, but this year we got a round trip rate of one fare plus \$2.00 in the Western Central Traffic Association, and in the Trunk Line Association, which takes in all the lines east of Buffalo and Pittsburgh, it has been a rate of one and one-third. I took the trouble to write to all the members whose addresses I knew informing them of a way to get around that. I see there are a good many here and I am glad I went to the trouble. They could buy tickets to Buffalo, Pan-American Exposition tickets, for a little more than half fare, deposit those tickets at Buffalo and get their tickets from Buffalo to this point for half fare plus \$2.00. As I said there is little to report except these facts, but I am satisfied that we have had a better and cheaper rate than ever before.

A. H. BRIGGS.

REPORT OF THE AUDITING COMMITTEE.

THE members of the Auditing Committee have examined the books of the Treasurer and find them absolutely correct, and think the gentleman has done very good service, indeed, and it is the opinion of the committee that he should have some help in keeping the books as the work is very laborious. It has got to be a great deal of work and there should be some recompense.

The Auditing Committee also recommends that the number of volumes issued be reduced from 750 to 500 copies. There have been a large number of volumes left over every year and we are paying \$90 a year storage on old volumes, an expense that certainly ought to be done away with. We do not need more than 500 volumes.

JAMES TAGGART PRIESTLEY,
THOMAS C. CLARK,
ROBERT HARVEY REED.

REPORT OF THE COMMITTEE ON JOURNAL.

THE Committee on Journal, after considering the various propositions submitted, reports that it believes the publication of a Journal inexpedient at the present time, further, that many of the points suggested as reasons for the publication of a Journal can be covered by the election of a permanent secretary, who shall be authorized to issue in pamphlet form within thirty days after the meeting of the Association the minutes of the meeting, lists of officers and committees for the ensuing year, and brief notes of interest regarding the meeting, and that circulars of information be issued by the Secretary whenever in his judgment such issue may be advisable.

C. P. WERTENBAKER,
T. C. CLARK,
JAMES TAGGART PRIESTLEY,
JOSEPH K. WEAVER,
CHARLES ADAMS.

REPORT OF THE NECROLOGY COMMITTEE.

DURING the past year I have had reported to me ten deaths which have occurred in the membership of the Association:

Louis W. Read, Col. and Surg. General, of Pennsylvania,
Ex-President.

Truman W. Miller, Major and Surgeon, I. N. G.

Michael R. Piggott. P. A. Surgeon (Lt. j. g.) U. S. N.

William H. Egle, Major and Surgeon, N. G. Pa.

Alexander S. Porter, Captain and Asst. Surgeon, U. S. A.

John H. Grove, Ex-Brev. Lt. Col. and Surgeon, U. S. V.

Andrew C. Bergen, Lt. Col. and Surgeon, N.G. Iowa.

Frank T. Lincoln, Major and Medical Inspector, Ga. V.

Franklin Gauntt, Lt. Col., and Surgeon, N. G. N. J.

Selden J. Mudge, 1st Lt. and Assistant Surgeon, N.G.N.Y.

I am obliged to say that notice of these deaths was not given me quite early enough to have a full obituary list prepared. Maj. Weaver has prepared a notice upon the death of Col. Read, and Maj. Halberstadt has prepared the obituary of Maj. Egle. If it is the pleasure of the Association I will continue the work and see that obituary notices of all these deceased members are prepared for publication in the next volume of transactions.

GEO. COOK,
Chairman.

Colonel Louis W. Read.**President, 1895-1896.****Born July 5, 1828—Died October 31, 1900.**

COL. READ was the eldest son of Thomas and Sarah (Corson) Read, and was born at Plymouth, Montgomery county, Pennsylvania, July 5, 1828. His parents were natives of Delaware county, as were his grandparents, William and Susan Read, and his mother was a daughter of Joseph Corson, and a sister to the late Drs. Hiram and William Corson.

He received his education in the early common schools and Treemount academy. Leaving school he read medicine with his maternal uncle, Dr. William Corson, and then entered the medical department of the University of Pennsylvania, from which he was graduated in the class of 1849. After graduating he devoted himself to his profession, and while thus engaged came the Crimean war cloud in southern continental Europe, which opened before him an extended and highly valuable field for scientific observation and practical work. He offered his services to the Russian government, and being accepted, he served as a surgeon throughout the Crimean war, and was at Sebastopol during its long and terrible siege by the allied forces. During this service under the Czar, he effected important improvements in the manner of treating gun-shot wounds, which were afterwards generally adopted, both in Europe and the United States.

Leaving Russia at the close of the war, he spent six months in the hospitals of Paris where he had a new and valuable field for the study of serious wounds and complicated diseases.

Returning home in the autumn of 1857, he came to Norristown, where he has been successfully engaged ever since in the practice of medicine and surgery. While ranking with the foremost of his profession as a general practitioner it was as a military surgeon he won his highest position and widest fame.

When the late Civil War commenced, Dr. Read was enjoying a fine practice, but he tendered his services to the government. In May 1861, he was appointed surgeon of the



COLONEL LOUIS W. READ.

First Pennsylvania Reserves, and in June was promoted to surgeon of United States Volunteers, with the rank of Major, and assigned to the Thirteenth Pennsylvania infantry. He

resigned this position in 1863, to accept the medical directorship of the Pennsylvania Reserve Corps, and in November, 1864, was placed in charge of McKim United States hospital at Baltimore, and remained there until March, 1866, when the hospital was closed and he was mustered out of the Federal service with the rank of Brevet Lieutenant Colonel of United States Volunteers, which had been bestowed on January 12.

From the time of his return to private life until six weeks prior to his death, Dr. Read continued in active practice. He was Surgeon General of the National Guard of Pennsylvania from May 15, 1874, when he was appointed by Governor Hartmanft, with the rank of Brigadier General, continuing in the same office when, upon the later organization, its rank was made that of Colonel, until shortly after the inauguration of Governor Stone in 1899. While at the head of the Medical Department of the Pennsylvania National Guard, Surgeon General Read secured many important changes, looking to the more advanced treatment of the sick and wounded, and brought the Hospital Corps up to a high standard of efficiency.

Dr. Read was long regarded the leading practitioner in his community, and his fame as a surgeon was as widespread as his name for good fellowship. An incident in his life that brought him into prominence was his removal, in December, 1863, of the bullet that disabled General Hancock at Gettysburg. The General had lain many weeks on a bed of suffering at his Norristown home, and his life was despaired of. The General himself had given up all hope of ever being able to rejoin his comrades, until on a December day in 1863, when he was visited by Dr. Read, who had come home on a day's leave. At the request of the General, with whom he had long been intimate, Dr. Read probed the wound and removed the bullet, and was accorded the distinction of having saved the life of the hero of Gettysburg, a fact which added greatly to his already high reputation.

Dr. Read was a member of the Military Order of the Loyal Legion, the Union League, the Association of Sons of the

Revolution, the United Service Club and the Historical Society of Pennsylvania.

He was a charter member of the Association of Military Surgeons of the United States and an influential factor in its formative days. He was elected second vice-president in 1893, first vice-president in 1894, and president in 1895, presiding with great dignity and acceptability at the magnificent meeting worked out under his direction at Philadelphia in 1896.

He pursued his profession until the last, with great activity and industry, and was held in high esteem by his professional brethren. He was of genial nature, social disposition and kind heart, which endeared him to all who were brought in contact with him. He died in the bosom of his family,—a quiet painless death,—and was buried, mourned by the whole community in which he had so long resided, and by them acknowledged a hero and a public benefactor.

Major Truman W. Miller.

Born March 2, 1840—Died May 31, 1900.

MAJOR MILLER was a charter member of the Association of Military Surgeons, led thereto by experience in three services. Having graduated at Hobart College and pursued his medical studies at the College of Physicians and Surgeons of New York, his patriotic spirit pressed him to service in the War of the Rebellion and in 1862, he became a Medical Cadet in the United States Army; and a year later, having received his doctorate from Geneva Medical College, was appointed Acting Assistant Surgeon. He served in the Army of the Potomac until after the Battle of the Wilderness when he took station at Chicago as attending surgeon and examiner of recruits, continuing his duties to the end of the War.

In 1873 he was appointed Assistant Surgeon in the United States Marine Hospital Service, becoming Surgeon

in 1877 and remaining in active service for the ensuing nine years.

The State troops formed another outlet for the soldierly spirit so conspicuous in his nature, and for five years he served most efficiently as Surgeon of the First Regiment of the Illinois National Guard.

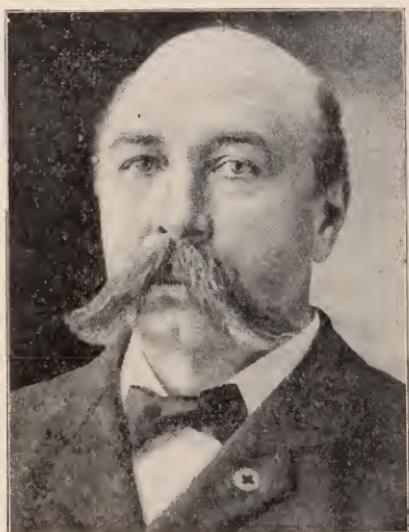
His professional activities ran along many lines. He was prominent as a medical educator and at the time of his death

was President and Professor of Surgery of the Chicago Policlinic. Many of the hospitals in the city sought his services and at the time of his death he was surgeon to the Maurice Porter Children's Hospital and consulting Surgeon to St. Joseph's, German, and Alexian Brothers' Hospitals. Numerous railway lines took advantage of his surgical skill, and a number of insurance companies regarded him as a court of last resort.

In addition to his relations with the Association of Military Surgeons, he was a

member of the Grand Army of the Republic, and a member of many national and local medical societies, conspicuous among which were the American Academy of Railway Surgeons and the American Medical Association, being vice-president of the Board of Trustees of the latter, and at one time *ad interim* editor of the *Journal* of that body.

He was preeminently a man of action, endowed with a highly developed executive faculty and possessed of a remarkable power of discriminative judgement. Widely loved, he was widely mourned.



MAJOR TRUMAN W. MILLER.

Passed Assistant Surgeon Michael Royston Pigott, U. S. N.¹.

Born January 27, 1866—Died January 30, 1901.

PASSED ASSISTANT Surgeon Michael R. Pigott, U. S. Navy, was born in Boston, Mass. After receiving his earlier education in the local schools and graduating from the English High School at Boston, he entered the Massachusetts Institute of Technology to pursue the course in electrical engineering. Receiving an appointment as Naval Cadet he left that institution during his first term to enter the Naval Academy at Annapolis, Md., in September 1883. After completing the regular course there, he graduated, but was unable to receive a commission owing to legislation at that time limiting the line of the Navy.

He at once took up the study of medicine at the University of Virginia, where he received his degree in 1890. Subsequent to his graduation he was occupied in various hospital and dispensary positions, including a period of service as interne at Bellevue Hospital. In March 1891, he passed the prescribed examination preliminary to entering the Medical Corps of the Navy, and on May 22nd was commissioned an Assistant Surgeon. During the next three years he was on duty in the Naval Hospitals at Chelsea and Mare Island, and made his first cruise of two years duration, on the Baltimore and the



MICHAEL R. PIGOTT, U. S. N.

¹Courtesy of the Surgeon General of the Navy.

cruiser Kearsarge; most of this tour of sea service being on the Pacific Station. Returning home in 1894, he passed his examination for promotion, and was commissioned a Passed Assistant Surgeon three years from his date of entry into the service. After a few months of duty on shore he joined the Olympia, then newly commissioned, and for the next three years remained on the Asiatic Station, returning to the United States early in 1898. Thereafter he was assigned to duty at the Naval Academy, making a short cruise as Medical Officer of the Chesapeake, the training ship for naval cadets, in the summer of 1900, and returning to the Academy in the fall. Throughout this tour of duty he was constantly and actively employed and he continued to be so engaged up to the very day of his death. There had been apparently no indication of organic heart trouble, and his death was therefore a sad surprise to his many friends within and without the service. It occurred during the night of January 30th, 1901, and was due to paralysis of the heart.

Modest and gentle in demeanor, Dr. Pigott never had a photograph taken of himself, from the time of his entrance to the Naval Academy, and the portrait herewith presented has been extracted from a family group taken while on leave at his home.

Captain Alexander Shaw Porter, U. S. A.

Born February 5, 1868—Died January 6, 1901.

THE University of Maryland at its Commencement, April 8, 1899, conferred the degree of M. D. upon Alexander Shaw Porter who was born soon after the Civil War at Lonaconing in that state. In 1893, he appeared before the army medical examining board and won a commission as 1st Lieutenant and Assistant Surgeon with rank from Oct. 26 of that year. His work at the Army Medical School, which followed was of a high order and brought him out, upon graduation in 1894, second in his class. He was then ordered to duty in the

Department of Dakota, but transferred, six months later to the Department of the Platte, where he served until failing health compelled his absence on sick leave for four months early in 1898. He was then stationed at San Diego, California, for a year, in the hope that the climate might alleviate his malady, but on examination for promotion in May 1899, he was found physically disqualified by reason of pulmonary tuberculosis contracted in the line of duty, and on June 8 was retired from active service with the rank of Captain. His affection continued steadily to progress until he succumbed, at Fort Whipple, Arizona, January 6, 1901. During the period of his disability he never ceased to maintain his professional enthusiasm, and was always interested in the work of the Association of Military Surgeons of which he became a member while on sick leave in 1898.



CAPTAIN ALEXANDER SHAW PORTER.

Major William Henry Egle,

Born September 17, 1830—Died February 19, 1901.

MAJOR EGLE was attacked with grippe February 15, which rapidly developed into pneumonia to which he succumbed five days later. He is survived by a widow and two daughters. A son died in early manhood, on the thresh-

old of a most promising career as a physician, and scientist.

His ancestors settled in Pennsylvania prior to 1740. A great grand-father served as an officer in the French and Indian wars. His paternal grand- and great grandfathers served in the war of the revolution, and his maternal grandfather served in the war of 1812.

He was educated in the public schools, and the Harrisburg academy. In 1848 he was tendered the appointment of midshipman in the United States navy, which was declined. At the close of his school life, he spent three years in the of-

ice of the *Pennsylvania Telegraph*, and had charge of the state printing, which was done in that office. In 1853 he edited the *Literary Companion*, as well as the *Daily Times*. In 1857 he entered the Medical Department of the University of Pennsylvania, and was graduated in 1859. He practiced his profession in Harrisburg until 1862,



MAJOR WILLIAM HENRY EGLE.

when he went to Washington in response to a telegram from Adjutant General Russell of Pennsylvania, to assist in the care of the wounded, after the battles of Chantilly and second Bull Run.

In September 1862 he was commissioned assistant surgeon of the Ninety-sixth regiment, Pennsylvania volunteers, and arrived at his post on the eve of the battle of Antietam. In 1863 he was appointed surgeon of the Forty-seventh regiment, Pennsylvania volunteer militia. In 1864 President Lincoln appointed him surgeon of volunteers. He was ordered to

Camp Nelson, Kentucky, to examine colored volunteers. He was subsequently detailed under Colonel James S. Brisbin and Colonel James F. Wade in the famous attempt of General Burbridge to destroy the salt works in South-Western Virginia. Later he served in the Department of the James under General Butler, as surgeon of the One Hundred and Sixteenth United States Infantry. Subsequently he was assigned to the Twenty-fourth army corps, General Birney's division, as executive medical officer, and accompanied that division during the Petersburg and Appomattox campaigns. Upon his return he was ordered to Texas with General Jackson's division, as chief medical officer, and served then until December 1865, when he resigned and returned to Harrisburg, and resumed the practice of his profession.

Upon the organization of the National Guard of Pennsylvania in 1870, Dr. Egle was appointed surgeon in chief of the Fifth division with the rank of lieutenant colonel. With the reorganization of the guard he was appointed surgeon of the Eighth regiment, and served with that command until 1885, when he was appointed Brigade Surgeon and assigned to the Third Brigade. With the Guard he saw service in the "Sawdust War" of 1871, the railroad riots at Pittsburg in 1877, and at Homestead in 1892. On account of an injury to his knee, he was compelled to resign his commission in April, 1898.

From 1867 to 1871 he served on the board of Pension Examiners. For twenty years he was physician to the Dauphin County prison.

He was appointed state librarian by Governors Beaver, Pattison, and Hastings, and served in that capacity for twelve years. The present effectiveness of the state library is very largely due to Dr. Egle's management.

In 1865 during relaxation from professional work, he commenced his "History of Pennsylvania" published in 1876, and followed by his bi-centennial edition in 1883, of which 15,000 copies were sold. Among his other literary works, were the "Historical Register," in two volumes (1883-1884); "History

of the County of Dauphin" (1883); "History of the County of Lebanon" (1883), "Centennial of the County of Dauphin, and the City of Harrisburg" (1886); "Pennsylvania Genealogies, chiefly Scotch-Irish and German" (1886), reprint (1896); "Harrisburg on the Susquehanna" (1892); "Notes and queries, historical and genealogical and biographical, relating to the interior of Pennsylvania," first and second series, two volumes (1878-1882), reprint two volumes, (1894-1895), third series, two volumes, (1887-1891), reprint, (1895-1896), three volumes; fourth series, two volumes (1891-1895). He edited the second and the first twenty-six volumes of the third series of the "Pennsylvania Archives."

Dr. Egle also wrote two hundred biographical sketches of prominent Pennsylvanians, for Appleton's Encyclopedia of Biography, and also biographical sketches of the members of the constitutional convention of 1776, and of the delegates to the Pennsylvania convention to ratify the constitution of the United States.

Lafayette College conferred the honorary degree of A. M. in appreciation of his services in American history.

Dr. Egle was a corresponding member of many historical societies in the United States and Europe. He was one of the founders and first President of the Pennsylvania German society. He was a member of the Military order of the Loyal Legion, the Society of the Army of the Potomac, and of the Grand Army of the Republic, the Cincinnati, and the Societies of Colonial Wars, the Sons of the Revolution, the War of 1812, and of Foreign Wars of the United States; the Dauphin County Medical Society, the State Medical Society, the Harrisburg Academy of Medicine, and an active member of the Association of Military Surgeons of the United States from its foundation.

Lieut. Col. John H. Grove, U. S. V.

Born January 13, 1825—Died April 6, 1901.

BORN in Maytown, Pennsylvania, John H. Grove, after receiving his preliminary education in the public schools of his native county, took a course at Barnet Academy, in Marietta. He then entered the Medical Department of the University of Pennsylvania, graduating in 1849. In later years he received the honorary degrees of A. M. from La Salle College, Philadelphia, and of LL. D. from Manhattan College, New York.

Soon after graduating he commenced the practice of his profession in Marietta, where he continued until the outbreak of the Civil War. In 1861 he received the appointment of Brigade Surgeon in the United States Volunteers, with the rank of Major. He was later breveted a Lieutenant Colonel and served until 1865.

In 1867, Dr. Grove, commenced the practice of his profession in Philadelphia. During his long residence there he contributed articles freely to the medical journals. Immediately after the building of St. Agnes's Hospital he was chosen Medical Director, at the same time holding a similar position at St. Mary's Hospital, which position he retained for several years.

In 1899, Dr. Grove presented a handsome memorial chapel to the Presbyterian Church at Marietta, Pa., where he was buried.

He was a fellow of the College of Physicians, and since



LIEUT. COL. JOHN H. GROVE.

1896 an associate member of the Association of Military Surgeons of the United States. He was also connected with the Legion of Honor, Union League, American Medical Association, Pennsylvania Medical Society, Philadelphia County Medical Society, the Pathological Society of Philadelphia, the General Alumni Society of the Medical Department of the University of Pennsylvania, the Alumni Society of Manhattan College, the Medical Club of Philadelphia, the Loyal Legion and Meade Post, G. A. R.

Lieut. Col. Andrew Conover Bergen.

Born February 3, 1849—Died October 3, 1900.

COLONEl BERGEN was born in Franklin, Indiana, but was educated at the Vinton, Iowa High School. He began his medical studies at the Medical Department of the University of Michigan but completed them at the Long Island College Hospital, from which he received the degree of M. D. in 1870.

From 1874 to 1883, he served as Acting Assistant Surgeon in the United States Army, and, upon his resignation, he identified himself with the National Guard of Iowa, of which he became Deputy Surgeon General with the rank of Lieutenant Colonel, further manifesting his interest in military surgery by becoming one of the charter members of the Association of Military Surgeons of the United States.

He was Professor of Pathology and Bacteriology in the Sioux City College of Medicine, a member of the Medical staff of St. Joseph's and the Samaritan Hospitals, and a member of the American Medical Association, the Iowa State Medical Society, the Missouri Valley Medical Society and the Sioux City Medical Society.

He was preeminently, in the words of a resolution adopted by his home medical society, "an honorable gentleman who

never spoke one disparaging word of a competitor, and always kind and courteous, whether at the surgeon's operating table, in society, or at the bedside of the sick."

Major Frank Thorla Lincoln.

Born July 5, 1856—Died June 28, 1900.

THE light first shown upon Frank Thorla Lincoln in the beautiful southern city of Savannah and in Savannah he passed his days and worked out his career. His father, William W. Lincoln, placed him under tuition at Bogart's Classical School in that place, and then sent him to Hartford, Conn., where he was graduated from Trinity College in 1876 with the baccalaureate degree in arts. He then repaired to the University of Maryland and for three years pursued the study of medicine in the medical department of that institution, receiving his doctorate in 1897. He at once entered upon the practice of his profession in the city of his nativity, where he promptly allied himself with the best professional and social life of his day. He was a member of the staff of St. Joseph's Hospital and an active participant in the work of the Georgia State Medical Society.



MAJOR FRANK THORLA LINCOLN.

In 1885, he was appointed assistant surgeon of the Chatham Artillery, and in 1893 he was promoted Major and Surgeon. In 1894 he was elected to membership in the Association of Military Surgeons. He was present at the fifth annual meeting in Washington and, by his cordial manner and kindly courtesy made many friends.

In the Yellow fever epidemic of 1894, he was government inspector at Jersey, Ga., and organized and maintained so effective a quarantine that it became the northernmost limit of the disease, not a single case occurring beyond this limit.

He died June 28, 1900, at the Savannah Hospital of heart failure consequent upon grippe, and was buried on June 30, with military honors, his old company, the Chatham Artillery, furnishing the escort and firing the salute.

Lieut. Col. Franklin Gauntt.

Born May 16, 1823—Died July 7, 1900.

ON August 7, 1893, Lieut. Col. Franklin Gauntt of Burlington, N. J., was elected to active membership in the Association of Military Surgeons of the United States. Colonel Gauntt had been surgeon of the second brigade of the National Guard of New Jersey since 1870, and had previously served as a volunteer surgeon in the United States army during the Civil War. He was also one of the surgeons to the Pennsylvania railroad and an alumnus of the Medical Department of the University of Pennsylvania, from which he received his doctorate in 1847.

The Opening Session.

ADDRESS OF WELCOME ON BEHALF OF THE STATE OF MINNESOTA.

BY HON. SAMUEL R. VAN SANT,

ST. PAUL, MINN.

GOVERNOR OF MINNESOTA.

I ASSURE YOU it is a great pleasure to welcome to our State the men here assembled. We have the highest appreciation (I have especially, being an old soldier) of the army surgeon. I do not know that I can do better than to tell a little circumstance that happened early in my life in connection with one of these men. I enlisted forty years ago in the Union army. I was very enthusiastic, especially before I got into camp, but it was so disappointing when I did get there. I supposed we would have pie and cake and all the good things we used to have at home on our table. I remember I used to eat off the rear end of a wagon or the soft side of a board. I knew the surgeon very well. As my name commences with a V, I was way down on the list, and as he had rejected ten of the boys by the time he got to my name I made up my mind I did not care much whether I was rejected or not. He made a very thorough examination of them all, but when he came to me he said, "Run along, Sammy, you're all right." He never gave me an examination. (Laughter.) I readily forgave him, for during the three years I was in the army I never had to take a bit of his medicine. I well remember how kind he was, and how, when we would go to him in the dead of night after a wearisome day's march he would have a cheery and encouraging word for us, and how at any time of

the day or night he would go to the side of our comrades and administer to their wants.

I well appreciate the fact too that you live in this splendid age, and that you have kept up with the progress that has been made in every department.

I welcome you to this great state, and our welcome is as broad as the state is wide. This is an empire in itself. We hear a great deal about Massachusetts, Vermont, Rhode Island and the rest of the New England States, but I tell you Minnesota is larger than the New England states combined with New Jersey and Delaware thrown in. (Laughter and applause). We are only a young state, yet we have more miles of railroad than all of New England combined. Think of it, if we were to populate Minnesota as densely as Belgium, we could take care of forty-four millions of people. We are a healthy state; we hardly need the doctors. The ozone is perfect, the air is invigorating. It is a great state for invalids. I came here an invalid and—well, you know how I look now. (Laughter.)

I want especially to give a welcome to those people from the South Land this morning. This is very appropriate from the fact that this is our great Memorial Day. You are welcome here. This welcome comes from the old soldier, and when you go back tell the people down there that the old soldier up here told you that when he goes south the best friend he meets is the old, grizzled veteran that forty years ago tried to shoot him to death. (Applause). We can afford to congratulate ourselves that we live in this time and have seen the sons of the men who wore the blue and who wore the gray following the old flag and vying with each other in upholding the honor of their country. (Applause).

I can say nothing more to you. You are welcome to the best we have. I am down stairs all the time and if you want anything rectified or things go wrong come down and see me and I will do what I can for you. (Applause). The state is yours, the capitol is yours; you can use these rooms, these buildings and lawns, you can use all you want as long as you

stay, and I hope you will use it well as we hope to use you well. (Applause.)

GEN. JOHN F. FULTON:—I am sorry to say that our mayor is nother, but he is afraid of doctors. I take pleasure, however, in introducing to you Judge Jaggard who will welcome you on behalf of the city.

ADDRESS OF WELCOME ON BEHALF OF THE CITY OF ST. PAUL.

BY HON. EDWIN A. JAGGARD,
ST. PAUL, MINN.

I AM not quite sure that when the Governor was speaking of rectifying things, the full meaning of his metaphor was apparent to you. What the Governor meant to intimate to you, gentlemen, was the cordiality on tap down below in which to cheer and recuperate your depressed spirits. (Laughter.)

The mayor of this city of St. Paul asked me to extend to you his official welcome. A council was held and the question was deliberated whether we should go through the traditional form of presenting you with the freedom of the city, but we supposed that Dr. John Fulton had already made that provision so we did not think it necessary as you already own the town.

Dr. Stone years ago set the standard for efficient health commissioners all over the country. Dr. Stone has made a record in the city of St. Paul which entitles him to do as he pleases with this city, so we concluded it would be a work of supererogation to present you with the freedom of the city. We lawyers stand united in the belief that every man's house is his castle, and the king cannot enter unanounced, but the doctor is mightier than all others for he enters our houses in the capacity of a sanitary inspector whether we will or not. (Laughter.)

Now, to be serious, the people of St. Paul honor the medical profession and we feel happy to have you in our midst. They welcome you with a full and thorough appreciation of

your high purpose and patriotic enthusiasm. They welcome you with the personal knowledge and the observation of the benefits that follow mankind from your ministrations from the cradle to the grave. Then they welcome you because of your cooperation. That, perhaps, is the key note of the day; that, perhaps, is the source of more trouble and travail than all other existing phenomena. It was not a sane man who cried, "Each man for himself and God for us all." Cooperation is a necessary condition of human existence. Cooperation is universal and is necessary to human activity. We know that people cooperate whether they will or not. There was a fallacy once taught and still practiced that theoretical knowledge was of no value, but just stop and think how one man helps another man. When Priestley discovered oxygen did he contemplate its service to science as applied to humanity? and yet that theoretical discovery has been the origin, perhaps, of more human progress than almost any one discovery in chemistry. So I might go on indefinitely in medicine, from the crude things which were hailed as great discoveries down to the present development great men have been cooperating one with the other. But, after all, gentlemen, it is the patient, quiet, every day average man who does the hammering out; it is the ordinary physician who does the work; it is the ordinary physician who comes down from the idea of speculating in the stars; it is the ordinary physician who in the long run causes the development of medicine. It is the register of his experiments, the record of his experience which has established the standing of your profession, the ministration of which is alike the comfort and the glory of our day and race. The world looks upon your profession with a special pride and pleasure. The world honors you as disciples and followers of the highest type of the new philosophy. The world honors you because you have worshipped an idol of authority, because your only God has been the God of Truth. The world honors you because you have searched the extremities of the earth, you have penetrated the recesses of the mountains, you have gone to the

depths of the sea in search of clinical experience and remedial agents. You have done this with a love that was imperishable, with a faith that was unconquerable, a faith that was sublime, and the result has been a benefit to mankind comparable only to the sun whose beneficent rays maintain and lengthen life.

Gentlemen, on behalf of the citizens of St. Paul, on behalf of the mayor of St. Paul, on behalf of the officials of St. Paul, I extend to you a welcome full of heartfelt appreciation of the great good your profession has done. (Prolonged applause.)

GEN. JOHN F. FULTON:—I now have the pleasure of introducing our President, Gen. A. J. Stone, and in introducing him I will say that the whole Northwest appreciates the honor you have conferred upon its people by electing Dr. Stone your president [See page 106.].

The President's Annual Address.

THE STATUS OF THE MILITARY SURGEON.

BY BRIGADIER GENERAL ALEXANDER J. STONE,

ST. PAUL, MINN.

SURGEON GENERAL OF MINNESOTA.

IT IS with great diffidence that I undertake the task of presiding over the deliberations of this Association composed, as it is, of men whose reputation is coextensive with scientific progress throughout the world and I should indeed falter did I not know the generosity that invariably accompanies moral and mental strength and which will treat with leniency any failure upon my part.

It is my pleasant duty to welcome you to this State and City on behalf of the members of the medical profession and I can only regret that I have not the wit and eloquence of my predecessors with which to convey to you the admiration which the profession have for your past achievements and the personal love which they feel towards many of you for the self sacrificing devotion with which you have proven your love for your country as well as for your fellow men.

It is their pride that a few from their own number have proven their devotion to our flag by sacrificing in a modest way that which many of you have in much fuller measure and, as they realize more and more the scientific value of the work which has been accomplished in the comparatively short and bloodless war just passed, they more willingly pay tribute to the spirit which prompted the sacrifice.

In this body of scientists they recognize the genius of organization and appreciate the fact that, to those who have gained experience in the care of large bodies of men, must they look for counsel and advice in periods of wide spread

epidemics and that especially to the members of the Army, Navy and Marine Hospital Service must they turn for guidance in the event of the introduction of oriental epidemic diseases.

It is apparently paradoxical that the army surgeon is much less the surgeon and much more the practitioner than the surgeon of civil practice. But a comparatively small proportion of the mortality of a modern war is due to wounds received in battle and the surgeon finds it necessary to become a sanitary expert as well as a surgical operator. It is his duty to know the best location for a camp with its relations to a pure water supply and equally his duty to know how such supply can be contaminated by the camp and its surroundings and to so advise that the sanitation of the camp shall be as perfect as possible and his authority should be such that only the gravest of adverse conditions could overthrow his dictum.

The question of the location of the sinks should not alone be left to his judgment but his orders for prevention of infection from them should be implicitly carried out and such material as he requires be furnished unsparingly.

The experiments of the surgeons of the regular services have proven that through the mosquito are carried two diseases, one tropical and one almost universal, and have also proven that the carrier can be economically and effectually dealt with.

To the mind of the civilian practitioner it is a short sighted policy that so hampers the hand of the surgeon by limiting the amount of supplies or by encircling them with red tape that preventive medicine in its most effective form cannot be practiced.

With the acquisition of our Eastern possessions we have been obliged to cultivate a more intimate acquaintance with the epidemic diseases peculiar to oriental countries, and, again, do we find our teachers in the men of the regular service.

The most dreaded of these diseases of the East has already knocked at our doors and is now, apparently, intrenched at our Golden Gate. Comparatively mild in form, confined

almost entirely to the Chinese quarters of San Francisco, a disease of filth and low vitality, yet it is a menace to the whole nation. Surgeon General Wyman in his wonderfully exhaustive monographic report has pointed out the remedy. It is for the practitioner in civil life to learn the lesson taught by the work done in Cuba, Porto Rico, the Philipines and San Francisco and to become a sanitary propagandist in his state and municipality.

I do not believe that I overestimate the value which a closer affiliation between the army surgeon and the general practitioner would enure to the public. Nor do I undervalue the fact that the surgeon of the National Guard is the inter-mediator between the two. The laudable ambition of the surgeon of the Guard is to be as thorough, as exact and as conscientious in his work as his brother of the army and to fit himself so thoroughly during his connection with the Guard in time of peace that he may be an efficient ally in time of war.

The social and political relations of our country are such that it frequently happens that he of the Guard has not been able to secure the early educational or social advantages which are to be expected in the regular officers; yet that alone should entitle him to the greater credit for having used wisely those advantages obtained at a later date in life and, in a majority of cases, his appreciation of the deficiency makes him strive the more anxiously to win the approbation of the "Regular."

The Guardsman is constantly in contact with the Public. His official duties occupy but a small portion of the year, yet he goes to his Public with a sense of "noblesse oblige" which is but another evidence of his having, in his official life, imbibed the true spirit of the army surgeon. To his public he carries, not only what the ordinary practitioner learns from the general medical literature of the day; but also that which he has learned from the special medical literature of the army. He goes to his civilian practice better prepared to handle

masses and better qualified to act as mentor and protector for his community.

The present meeting promises to be not only a most valuable one from a scientific standpoint, but also from a social and economic one:

You will act at this meeting upon a resolution, which if passed, will wipe away another evidence that this country was ever divided against itself, and it rejoices my heart to think that I have yet by word or by line to learn of a single objection to the admission of those who, more than a generation ago, fought wearing the grey; but who have, within the past three years, fought for a united country and fought, wearing the blue.

At the last meeting a resolution looking to the establishment of a journal which should be the mouthpiece of this association was referred to a special committee. So far as I can ascertain, such a journal, if established, would be unique. The peculiar character of its papers, all of them more or less specialized, would lend a special charm to its pages which no other journal presents to its readers. Its *clientele* would embrace all who now have, or who have recently, had any connection with Military Surgery, and it is needless to say, the number of such physicians has wonderfully increased within the past three years. It is also to be borne in mind that the medical literature published by the Government is becoming more and more valuable to the lay practitioner, and that many who have never had any connection with military service look more frequently for articles from the pens of military surgeons.

The profession of the City of St. Paul welcome you most heartily to their home, which they love as one of the most hospitable cities in the world and it is with special pride that they ask me to point to the hearty, wholesouled and generous manner in which our citizens have helped to hold up our hands in this attempt to prove to you that you and those who follow you are more than welcome guests; you are honored friends.

Original Memoirs.

A PLEA FOR IMMEDIATE CELOTOHY IN PENE- TRATING GUNSHOT WOUNDS OF THE ABDOMEN IN WAR.

BY CAPTAIN CHARLES EDWARD BELIN FLAGG,
FORT GRANT, ARIZONA.

ASSISTANT SURGEON IN THE UNITED STATES ARMY.

IWISH here to put myself on record as a military surgeon advocating immediate celiotomy in penetrating gunshot wounds of the abdomen in war. I wish to take this stand because I can not but feel that I will not long be alone in this belief, though, so far as I know, no one else has expressed this conviction and I realize that the whole of military statistics are against it.

When a man receives a penetrating gunshot wound of the abdomen there is no immediate way of determining, without operation, if the abdominal viscera are wounded or hemorrhage is taking place. The accepted military way is to determine whether the abdominal viscera are injured or not by subsequent events, death or recovery, and if the latter, the symptoms during recovery.

It is claimed that perforating wounds of the intestine may close spontaneously and recovery follow. That this is more apt to occur when the wounds are made by the small caliber bullet seems plausible, but is not shown in the statistics I have at hand, for while in the Spanish American War 44 U. S. Regulars were so wounded and 29 died, a mortality of 65 per cent. as against 87.29 per cent. in the Civil War, seeming to show a less fatal result of the small caliber bullet, yet when we take the statistics of the last six wars in which

the large caliber bullets were used,¹ namely: Crimean War, English-French; Italian War, French; Civil War, Federals; Danish War, Prussians-Danes; Franco-Prussian War; and Japan-China War, we have 5490 penetrating abdominal wounds with 3649 deaths, making a mortality of 61 per cent., which is 4 per cent. less than that of our army during the Spanish-American War.¹ During the years 1898 and 1899 116 cases of penetrating gunshot wounds of the abdomen occurred in our army with a mortality of 81, making a mortality of 70 per cent, which is 17.2 per cent. less than the Civil War, and 9 per cent. more than the mortality of the six preceding wars, above mentioned.

Whether the original wound in intestine or stomach is large or small, there can be no tendency to closure of wounds by contraction of tissues, as this contraction is produced by action of the muscular fibers, circular, longitudinal or oblique, and is invariably away from the wound, the muscles pulling away from their severed ends, not pushing towards them. It is possible the wound may be closed by eversion of mucous membrane or by adhesion to the mesentery, omentum or an adjacent loop of intestine. This method of cure is not to be relied upon as statistics show. How often it occurs is a question, and it would seem as reasonable to suppose that in these cases of recovery the intestines escaped injury. However, as this question is a matter of speculation and lacks demonstration, as a mode of cure, it may be left practically out of consideration. These cases (30 to 35 per cent.) that recover, possibly by spontaneous closure of the intestinal wound or more probably by escape of abdominal viscera from injury, ought not to be killed if subjected to immediate celiotomy, and the other 65 or 70 per cent. ought many of them to be saved by it under a skilled operator.² The Surgeon General's report for the fiscal year ending June 30, 1900, gives the total number of these cases operated on as 10, deaths 9.² Of the three that I contributed to the list, the two that died would certainly have died without operation as there was no tendency to spontaneous closure of the wounds. One died on the table

of ether poisoning and the other, an insane Filipino, died on account of tearing out of the sutures by the aid of lumbricoid worms. The third, shot through the lung and abdomen, escaped intestinal perforation and was not killed by the laparotomy that was done on the field or by the transportation commenced before the patient was out from the ether. Civil surgeons are not deterred from operating on these cases of abdominal wounds because of the great mortality. Some may be saved and as our operative statistics increase in number they may show better results.

It is generally conceded that these cases occurring in civil life must be operated upon without delay and before extensive infection has taken place from intestinal leakage into the peritoneal cavity and this is equally applicable in the field. This is one of the few operations required to be done on the battle field. The only excuse for not operating is that we cannot have suitable conditions. The question of transportation of these wounded must be considered. Transportation is better borne by a case of intestinal perforation properly closed with sutures, after laparotomy, than by the same case with unclosed intestinal perforation. The requisites for the operation are: 1st. A surgeon who is familiar with the technique of abdominal work. 2nd. Necessary surroundings and appliances. Shelter, heat, water, light, surgical instruments and dressings, a person capable of administering an anesthetic, and, preferably, one trained assistant, are needed. A house or tent affords the necessary shelter and it is very rare that one or the other is not available. Heat can be obtained by means of a Sibley, coal oil or alcohol stove carried for the purpose. Water can be boiled in the operating room, or outside on an open fire. Cold sterile water may be kept in canteens. When daylight is not available a lamp or candle will suffice as it often does in civil life. A table may be improvised of a litter or otherwise. The instruments and dressings supplied to regiments by the Medical Department, U. S. A., are entirely sufficient for this work and are easily transported. If an anesthetist is not at hand spinal cocainization can be employed.

If asepsis can not be secured these operations should not be done, nor should operations of any kind be done. If asepsis is lacking, it is, in nine cases out of ten, due to the lack of energy, foresight or training of the surgeon and should be condoned no more than a lack of quinine in a tropical campaign.

As to lack of time; the proportion of abdominal wounds to other wounds is small and it is conceded that all operations that can with safety to the patient be postponed, should be done at the base. The time then that is consumed in abdominal operations would be taken from the important but not intricate procedure of applying the contents of first aid packets, a procedure taught to every soldier of the line in our army, or from the heroic and commendable act of carrying the wounded out of the line of fire to places of safety, or, possibly, from the administration of beef tea, aromatic spirits of ammonia or other stimulant; all necessary procedures but not requiring the skill or judgement supposed to be possessed by the army surgeon.

No drainage would be required in these celiotomies and hence the danger of infection from redressing en route to the base, a very real and imminent danger, would be avoided.

Be it distinctly understood that it is far from my purpose to suggest that every doctor connected with the army, under whose care a perforating gunshot wound of the abdomen might come, should immediately open all such cases. If a surgeon has not been trained in such work on the lower animals or as 1st assistant to an abdominal surgeon it would be as well for him to let those cases die undisturbed, with, however, the distinct understanding on his part that the non interference is due to an inability to do this work, off as well as on the field, and not to "lack of time," "almost insurmountable difficulty of securing asepsis," etc., etc.

REFERENCES.

¹ Military Surgery by W. C. Borden, M. D., Capt. Med. Dept., U. S. A., etc., from the Philadelphia Medical Journal, 1900, reprint, page 44.

² Report of the Surgeon General of the Army to the Secretary of War for the fiscal year ended June 30, 1900. Page 297, and 323.

Against the argument that a surgeon capable of doing this work is seldom available where these injuries are received I have little to say, but I protest against the commonly accepted teaching that there are insurmountable difficulties in the way of rendering effective aid to these cases.

Fort Grant, Arizona, February 1, 1901.

DISCUSSION.

LIEUT. COL. J. D. GRIFFITH, Mo.—I have heard with a very great deal of interest the paper that has just been read, and let me say that it fills a place that has heretofore not been occupied. That an active interference early in a gunshot wound of the intestines is necessary, is beyond any doubt as a rule. But I do think, that under these circumstances there is no rule, because it is a very hard matter to acquire just what is necessary; in other words, to get a tent, to find a house, or get up to a temperature of 88° or 96°, which is preferable in laying a belly wide open and frequently hunting for half an hour or more for an opening you may have left; in other words you have got to strip the gut from one end to the other. Your humble servant has been placed in this position and knows thoroughly what it means, and I can assure you that when at the post mortem examination I have found that I left a wound unattended it caused a feeling of chagrin, when the coroner made his report. Now let me say, this non-interference with abdominal wounds on the firing line was probably fashionable in the Spanish-American running match. Is that right? I can assure you, gentlemen, that when Nicholas Senn spoke of this matter so forcibly he meant that the surroundings were such that it could not be done scientifically. Dr. Senn will probably himself tell you that he has hunted for an hour for one of these wounds of the gut. The smaller the wound the harder it is to find. And then again, every man that has gone into this kind of thing, (and I see one or two gentlemen who have, especially from my own city), will tell you the same thing, that it is hard to surround yourself immediately with just what you want. Asepsis is not an easy thing to get under such conditions. In an operating room you have every requirement you need, all the scrub brushes, hot and cold water you want. It is a hard matter sometimes to determine, and I don't know, but it strikes me that the fatalities that are spoken of as resulting in the last six wars were those which were taken to be intestinal wounds

where the abdomen was perforated and the gut was not touched. Capt. Flagg says in his paper that there was no evidence of either the one or the other if I remember rightly. The paper has not covered the ground entirely. It is not what we want. Let us have the ground completely covered: that is what I mean.

LIEUT. COL. JOHN VAN R. HOFF, U. S. A.—There is one thing I would consider in connection with this discussion, and that is the remark Col. Griffith has just made in regard to determination of the diagnosis. In my letter to Capt. Flagg I said I was opposed to diagnostic explorations on the firing line, and I believe ninety-nine one-hundredths cases could be determined on simple diagnostic principles.

LIEUT. COL. R. J. FITZ GERALD, Minn.—I concur with the remarks of Col. Hoff. After twelve months in the tropics, doing work in the abdomen following gunshot wounds I found the best results obtained were in those cases that were treated on the expectant plan. It was found that where early operations were resorted to you not only had the shock of the primary wound, but that also of the following operation, and it was found that in a large percentage of the cases they ultimately succumbed, not only as the result of the shock, but as the result of early interference. The rule followed by myself and others in Manila,—and I would first add that nearly ninety-five per cent of the wounded were immediately passed to the first reserve hospital in Manila during the first three months of the insurrection, and we had ample opportunity to observe the results of the treatment of these cases, but the rule was invariably followed to allow the patient sufficient time for reaction; and sometimes if hemorrhage did not exist it was found necessary to make an opening large enough to establish drainage, and drainage was made in the abdomen, and this treatment gave the best class of results. Nearly all cases that were operated on early after the injury died, but a fair percentage of the cases treated as I have mentioned made a fair recovery. In many cases subsequent operations were necessary, but in the ultimate the results were fair. I do believe, as the author of this paper should know from experience in the Philippines, that an early operation is certainly contraindicated and is condemned by every man who has had experience in this line.

LIEUT. COL. JOHN VAN R. HOFF, U. S. A. (*Closing discussion*).—I have nothing to say in regard to this matter. I had made up my mind so far as my reading, experience and the ob-

servation of the cases of people who have had a larger experience than I that all things seem to point to the fact that any operation that was not absolutely necessary to save life was not justified, at least in the field hospital. As I said before, exploratory procedures for diagnostic purposes I do not think are justified under any circumstances. I am very certain Capt. Flagg has not a more enthusiastic advocate of his views than the gentleman who read his paper, but I must say, as I told him, that I do not agree with the proposition he advances.



SUPRAPUBIC OPERATION FOR VARICOCELE AND
OTHER CONDITIONS OCCURRING WITHIN
THE SCROTUM REQUIRING SUR-
GICAL INTERFERENCE.

BY MAJOR ALFRED E. BRADLEY,
FORT SNELLING, MINN.

BRIGADE SURGEON OF VOLUNTEERS; CAPTAIN AND
ASSISTANT SURGEON, U. S. ARMY.

ALL works of reference at my disposal fail to mention any but the scrotal route in operations upon the contents of the scrotum. It is possible and probable that many operators have used the high operation but in view of the fact that it has not been described nor alluded to in standard works on surgery it is fair to presume that it is a new method of procedure, and as such and possessing as it does undisputed advantages over the scrotal route it is considered a subject which may be of interest to all surgeons.

On December 22, 1900, I made a brief report to the Surgeon General, U. S. Army, of three cases in which I had used the suprapubic method for varicocele which will be found as part of Circular, No. 3, Surgeon General's Office, dated February 22, 1901.

This circular contains several reports from other medical officers and is herewith given in full.

CIRCULAR, } WAR DEPARTMENT,
 SURGEON GENERAL'S OFFICE,
No. 3. Washington, February, 27, 1901.

The attention of medical officers is invited to the accompanying papers relating to varicocele and its cure by surgical intervention. The rule laid down in Tripler's Manual should govern medical officers in the examination of recruits, viz,

that a candidate for enlistment should be rejected if he has a varicocele which is larger than the sound testicle. If, however, upon a subsequent examination, after enlistment, a recruit is found to have a varicocele as large as or larger than the sound testicle and complaint is made of disability arising from it, this should not be considered a cause for discharge, but for surgical treatment.

In this connection attention is invited to the following decision published in Circular No. 11, Adjutant General's Office, Washington, December 10, 1884:

Except in case of a capital operation involving the risk of life, a soldier can not refuse to submit to medical treatment or surgical operation without subjecting himself to trial by court-martial for wilfully avoiding treatment the purpose of which is to enable him to perform the duties for which he enlisted.

*Report of Lieut. Col. A. C. Girard, Deputy Surgeon General,
U. S. Army General Hospital, Presidio of San Francisco,
Cal., January 11, 1901.*

The pubes are carefully shaved the day before operation; a soap poultice is applied and the patient kept in bed. Next morning after the patient has been etherized, the pubes are scrubbed with soft soap and warm sterilized water, washed with warm sterilized water, then with alcohol and then wiped dry. The finger is introduced by the spermatic cord into the inguinal canal until the external ring is felt. An incision is then made corresponding to the axis of the canal, one inch long, the upper end ending over the external inguinal ring. Superficial and deep fasciae are divided with angular scissors, preferably over a Kocher director. The vessels of the cord then come into view. The finger is passed under the cord by a little blunt separation and the cord is raised out of the wound. The spermatic duct and artery are returned as soon as possible into the bottom of the wound to prevent accidental injury. A sound vein selected for preservation to return the blood from the testicle is carefully separated from the strand of veins and carried alongside the duct. The veins are then dissected from the connecting tissue for a distance of about two inches, ligated with small sized catgut at the end of these dissections and cut off between the ligatures which are left three or four inches long. The ligatures are then tied together, the upper and lower ends of the veins being approxi-

mated, and for further safety threaded to needles and the ends united by stitches and finally anchored to the external pillar of the ring. The deep and superficial fasciae are then carefully and separately united with a continued catgut suture, and the skin by a subcuticular suture of silkworm gut.

After a little practice this operation takes only a few minutes. The advantage over the Volkmann operation is that the seat of operation can be made absolutely sterile, which is almost impossible in the scrotum; that the scrotal tissue, being of a loose character and readily infiltrated, becomes a nidus for infection; that the scrotal scar will always be more or less tender, inconvenient and unsightly, while the suprapubic scar practically disappears, is invisible and not tender.

Sixteen cases have so far been operated on at this hospital. The men all recovered without any drawback and were returned to duty. Three of the men belong to the Hospital Corps and are now on duty at this hospital. They do not feel the slightest inconvenience from the operation, consider themselves practically cured, and there is nothing visible to show that they have ever had an operation performed. Special reports were transmitted in each case at the end of the month during which the operations were performed.

Below is a list of men showing hospital number, name, organization, and date of operation.*

The idea of this operation was first received from Dr. C. R. Krone, of Berkley, Cal., although I am informed by Colonel Forwood that this has been his method of operating at the U. S. Soldiers' Home, Washington, D. C.

The operation is easy and, if necessary, the patient might be discharged from hospital in two or three days, while scrotal operations, as a rule, take longer to heal.

Report of Maj. J. M. Banister, Surgeon U. S. Army, U. S. Military Academy, West Point, N. Y., January 12, 1901.

All surgeons who have been in practice a little more than a decade have seen a great revolution in the operative technic for the radical cure of varicocele. Before the advent of modern aseptic methods our attempts at the cure of this condition were bungling, imperfect, and unscientific, and as a consequence our results were unsatisfactory and uncertain. Such procedures as the amputation of the redundant scrotum; the subcutaneous passage of a silver wire around the veins, or pre-

*It is not considered necessary to publish this list. The first reported case was operated on October 10, 1899, the last November 14, 1900.

sumably around the veins, and the fastening of the ends of the wire to a button or yoke, applied at the point of their exit from the scrotum, with a daily tightening of the wire loop until the tissues in its grasp were cut through; the subcutaneous use of a silk ligature around the veins, which was tied tightly and the knot pushed into the scrotum were recommended and practiced. All these methods I have tried, but I am free to confess that my results were not satisfactory and in those days I never attempted the cure of varicocele with the slightest feeling of confidence. Now, thanks to modern aseptic technic, the skilled surgeon no longer works blindly, but by the open method exposes the enlarged veins, ligates and excises them to the needed extent, closes the wound and confidently expects first union and a perfect cure. The technic which I have pursued for some years in the surgical treatment of varicocele will now be described, but I wish in advance to disclaim any originality in this matter, as in working in this line I have been simply following in the steps of Professors Halsted and Bloodgood, of Johns Hopkins University.

The patient is prepared as for any other aseptic operation requiring the administration of an anaesthetic. The day before the operation he is placed upon a liquid diet and given a saline purge. Operating, as I do, almost invariably in the afternoon for reasons of convenience the patient early on the morning of the operation is given a cup of broth which is to be his only food that day. He is then required to take a bath, the hair on the pubes and scrotum is shaved, and a wet bichloride dressing applied. After the patient has been etherized and placed upon the operating table the antiseptic dressing is removed and the region of the operation including the scrotum is thoroughly scrubbed, first with soap and water then with ether and finally with a solution of bichloride of mercury, 1:1000. The patient is then covered with sterilized towels, the site of the proposed wound in the groin only being uncovered. The hands and arms of the surgeons and assistants having been sterilized and all those assisting in any capacity being dressed in freshly sterilized linen gowns and trowsers the surgeon commences the incision just above the spine of the pubic bone and carries it upwards and outwards for about an inch and a half or two inches, somewhat parallel to Poupart's ligament. I seldom make a longer incision than the one first designated. After dividing the skin I grasp the underlying layers of fascia with a mouse-toothed forceps in one hand and with a dull dissector in the other tear through

the layers until the external abdominal ring is exposed and the tunica propria of the cord comes into view, the layers of fascia being exposed throughout the whole extent of the wound. During this procedure the wound is held open by means of two small retractors. When the cord contained in its proper sheath has been clearly exposed the sheath is seized with the forceps and divided longitudinally when the large veins constituting the anterior portion of the cord become visible. The vas deferens and other structures of the cord, behind this group of veins must be interfered with as little as possible. This anterior group of veins should now be grasped between the fingers at the lower extremity of the wound and pulled upwards so that a portion of their extent contained in the scrotum near the upper termination of the pampiniform plexus may be brought into plain view in the wound. This can be done with the greatest ease and with the gentlest traction. What is desired by this maneuver is the drawing up of the enlarged and tortuous portion of the veins from the scrotum into the wound for ligation and excision. Having brought the veins to be treated into view they are held by a pair of forceps in the hands of an assistant or upon a blunt hook passed under them and an aseptic silk or kangaroo ligature is passed around them en masse at as low a point as desired, tied tightly and one end of the ligature cut off, the other end being, for the time, left uncut. The same veins are similarly treated at a point about an inch and a quarter higher up and the portion included between the ligatures excised and removed. The uncut ends of the ligatures are now tied thus drawing together the severed ends of the veins not with the object of securing end to end union, which would be impossible, but with the expectation that the testicle will be temporarily held up until adhesion shall have formed. After being thus treated the veins are pushed down into the scrotum where the ligatures can be easily felt between the thumb and finger. The wound is then closed either by interrupted sutures of silk-worm gut or by a subcuticular continuous suture of kangaroo tendon, which latter is now my favorite method of closing aseptic skin wounds. The wound is dressed with dry aseptic gauze and cotton and the whole held in place by a gauze spica bandage. The testicle which is not covered by the bandage, is supported during the period of confinement to bed and a suspensory bandage is ordered for constant use for a few months after complete recovery. The wound is redressed in one week when the sutures are removed if silk worm gut has been used. The patient is allowed to sit up in ten days. For a

time there will be a swelling of the obliterated veins below the ligature but this rapidly subsides and soon only a small lump can be detected in the scrotum.

Report of cases.—I have operated quite often in the manner described, having at times performed two varicocele operations at one sitting. The complete records of my operations performed elsewhere are not available, but I have the records of sixteen operations for the radical cure of varicocele performed at West Point, N. Y., which with the exception of case 4, are almost identical in results with those previously performed. In all my cases operated upon before my coming to West Point there was *first union, a complete cure of the varicocele, and no atrophy of the testicle.* This much I know, although I have not the names of the patients nor the histories of the cases at hand. The histories of the sixteen cases operated upon at West Point will now be given:

Case 1.—Cadet C. B. C. Operation by high incision, January 10, 1899. Result: Union per primam; no epididymitis; returned to duty with a perfect cure February 1, 1899. This cadet left West Point February 15, 1899, in consequence of graduation and is now an officer on duty in the Philippines.

Case 2. Cadet F. P. A. Varicocele, left side. Operation by high incision, March 24, 1899. Result: Union per primam; no epididymitis; returned to duty with a perfect cure May 4, 1899. Graduated in 1900 and is now an officer of the Army. This cadet remained for over a year at West Point after the operation and never had the least trouble up to the time of his departure.

Case 3.—Private R. Van V., Army service detachment. Operation by high incision performed May 29, 1889, in my presence by 1st Lieutenant D. F. Duval, assistant surgeon, U. S. Army. Result, the wound healed by first union, no epididymitis. I have just examined this man, who is still on duty at West Point and find the testicle unaffected. There has resulted, however, a small hydrocele, which gives no trouble of consequence.

Case 4.—Cadet T. N. G. This cadet was admitted to the Academy in June, 1899, with a varicocele of medium size. His military duties in camp caused the veins to enlarge very rapidly, and by August 11 the varicocele had attained a size that made an operation necessary to enable him to remain at the Academy. On the date mentioned I operated in accordance with the method described. The patient did well, the wound healed per primam, and there was no epididymitis. During convalescence the testicle was bruised several times, causing

a little swelling of the gland. This cadet was returned to duty September 2, 1899. A little while after leaving the hospital he received a contusion of the left testicle in the gymnasium, which caused a decided swelling of the gland, though the injury did not give rise to an acute orchitis. I have just examined this cadet sixteen months after the operation, and find a small hydrocele present and the testicle on the operated side somewhat larger than the other. He states, however, that he has never had the least trouble referable to the testicle or scrotum and that he performs his military duties and exercises with ease, a condition in marked contrast to that existing prior to the operation.

Case 5.—Cadet G. R. G. This cadet was admitted to the Academy in June, 1899, with a varicocele of medium size, which after about two months of duty in camp became increased in size to a degree which prevented him from performing his military duties. On August 14, 1899, I operated by the method described. The wound healed per primam; there was no epididymitis; no swelling of the testicle, and in fact not a single untoward symptom. He was returned to duty September 3 with an absolutely perfect cure. I have examined this cadet within the last few days, sixteen months after the operation, and find the result perfect. There is no atrophy of the testicle, no enlargement of the veins, nor any evidence that there has ever been any trouble of any kind.

Case 6.—Cadet R. C. T. This cadet was admitted to the Academy in June, 1899, with a varicocele of medium size, which rapidly enlarged in consequence of the military duties of camp until it became necessary to operate. I performed the operation on August 16, 1899. This cadet made a perfect recovery with no complication and was returned to duty September 3, 1899. I have recently examined this cadet, sixteen months after the operation, and find the result perfect.

Case 7.—Cadet B. B. McC. Like the three preceding cases this cadet was admitted to the Academy in June, 1899, with a moderately sized varicocele, which rapidly increased in consequence of the duties required of him in camp until an operation became necessary. On August 19, 1899, I performed the operation as described. A perfect recovery ensued. There was no sign of any complication during convalescence. This cadet was returned to duty September 3, 1899, with a perfect cure. I have just examined this cadet, sixteen months after the operation, and find the result absolutely perfect.

Case 8.—Cadet J. P. R. Varicocele, right side. Before coming to the Academy this cadet had been operated on by a

civilian surgeon for varicocele on the left side. The incision used at that time was through the scrotum. Adhesions had formed between the cord and scrotal wound, which caused the patient inconvenience, and singularly there had resulted a tendency to sweating on this side, which would be wet with perspiration, while the other side remained dry. A troublesome varicocele having developed on the right side during service at the Academy, this cadet applied to me for operation. I performed my usual operation on October 31, 1899, which was followed by no complication and resulted in a perfect cure. The result of the high operation stood in flattering contrast to that through the scrotal incision. This cadet was returned to duty November 28, 1899, graduated in June, 1900, and is now an officer of the Army.

Case 9.—Cadet N. C. M. This cadet applied to me in November, 1899, for relief from a troublesome varicocele, and I operated upon him November 15, 1899. The wound healed by first union, the cadet recovering without a complication and with a perfect cure. This cadet was returned to duty December 26, 1899, and graduated in June, 1900, being now an officer of the Army.

Case 10.—Private J. S. C., Company E, Battalion of Engineers. Varicocele, left side. The high operation was performed by my assistant, 1st Lieut. F. M. Kemp, assistant surgeon, U. S. Army, January 11, 1900. The wound healed per primam and a perfect recovery, without a complication, resulted. This soldier was returned to duty February 14, 1900, and is now on duty with his company in the Philippines.

Case 11.—Cadet V. La S. R. On January 16, 1900, I operated upon this cadet in accordance with my usual technic. He recovered without a complication and was returned to duty on February 17, 1900, with a perfect result. In June, 1900, he left the Academy in consequence of graduation and is now an officer of the Army.

Case 12.—Private A. J., detachment of Cavalry. Operated upon by me February 5, 1900. This soldier was returned to duty February 21, 1900. I have examined him within the last few days, eleven months after my operation, and find the final result absolutely perfect. There is no evidence that there has ever been any abnormality in this case.

Case 13.—Cadet F. O. W. On March 18, 1900, the operation by the high incision was performed in this case. The wound healed by first union; there was no epididymitis nor swelling of the testicle, and the cadet was returned to duty

cured May 19, 1900. He graduated in June, 1900, and is now an officer of the Army.

Case 14.—Cadet J. W. W. Operation performed March 8, 1900. The case progressed without a complication and the cadet was returned to duty with a perfect cure on April 21, 1900. He graduated in June, 1900, and is now an officer of the Army.

Case 15.—Cadet A. P. S. H. Operation performed March 20, 1900. There was not the slightest complication in this case, the wound healing per primam and the patient returning to duty April 18, 1900, with a perfect cure. He graduated in June, 1900, and is now an officer of the Army.

Case 16.—Private C. McI., detachment of Cavalry. Varicocele, left side. Operation in accordance with the writer's technic was performed by 1st Lieut. F. M. Kemp, assistant surgeon U. S. Army, April 10, 1900. The wound healed per primam, there was no epididymitis or other complication and a perfect cure resulted. The patient was returned to duty May 19, 1900. I have within the last few days examined this soldier and find the result absolutely perfect.

Resume.—In reviewing the histories just given it will be seen that in the sixteen cases recorded there has been first union in every case and that there has been no epididymitis as an immediate result of the operation nor any instance of atrophy of the testicle as a final sequence. A perfect result was obtained in fourteen out of the sixteen operations recorded. In one case, No. 4, the testicle on the affected side is at the present time, sixteen months after the operation, found to be somewhat larger than its fellow gland and a small hydrocele is discoverable. The patient, however, considers his cure perfect. Another case, No. 3, shows a moderate hydrocele, which is of no practical importance as it does not interfere with the performance of the soldier's duty.

General considerations.—Among my own cases and those of my former junior colleagues, Assistant Surgeons W. F. Lip-
pitt, John H. Stone, and Basil H. Dutcher, which were sub-
jected to operation before my coming to West Point, and
which are not included in the histories given above, I have
never known of a single case that did not result in a perfect
cure. In 1897 I saw one case, which had just been operated
upon by one of my colleagues mentioned, in which the scro-
tum was distended with blood, presumably from a slipping of
the lower ligature. This was remedied by the surgeon who
performed the first operation, and I was informed that an ex-
cellent result had been secured.

It can be appreciated, therefore, that when carefully performed the operation for varicocele is one of the most successful of surgical procedures, and that its possible disadvantages are so slight as to justify the surgeon in ignoring them when called upon to decide as to the advisability of operating in a given case. The high incision with the ligation and excision of the veins is without question the ideal operation for varicocele. It has decided advantages over the incision through the scrotum with few of the disadvantages of the latter.

The advantages of the high incision are:

1. The scrotal portion of the enlarged veins can be reached with the greatest ease through a small incision placed at the point of election.

2. The results of the operation through the high incision are better than those obtained by means of the incision through the serotum.

Dr. Bloodgood's statistics are as follows:

Incision in the scrotum, 16 cases. Ultimate result in these cases: Lost track of since operation, 10 cases: testicle normal, 4 cases; small hydrocele, testicle normal, 1 case; complete atrophy of the testicle, 1 case.

Incision in the groin, 29 cases. Ultimate result in these cases: Lost track of, or recent cases, 12 cases; no atrophy of testicle, 12 cases; hydrocele, 5 cases; atrophy of testicle, 0 case. Healing of wounds, scrotal incision per primam, 12 cases; suppuration, 4 cases. Healing of wounds, incision of groin, per primam, 27 cases; suppuration, 2 cases.*

3. First union can almost certainly be counted upon in the high incision. *In my personal experience I have invariably secured union per primam in my varicocele wounds when located in the groin.*

The disadvantages of the incision through the wall of the serotum are the following:

1. The difficulty of securing perfect asepsis, owing to the locality of the wound.

2. The tendency of the contractions of the dartos to drag on the wound causing gaping, thus opening the way for pyogenic infection.

3. Greater liability to atrophy of the testicle.

Referring again to my own statistics, I can say that I have never seen a case of epididymitis, or atrophy of the testicle, resulting from a varicocele operation performed by me. My results have been absolutely perfect, except in case 4, where traumatism occurred during and after convalescence, and in the case cited the relief from former inconvenience is

*See Dr. Jos. C. Bloodgood's paper in "The Johns Hopkins Hospital Reports, Vol. VII," page 350.

at the present time so great that the patient considers himself cured.

I conclude this paper by advancing the following propositions:

1. The operation for the radical cure of varicocele by the high incision with ligation and excision of the veins is one of the most successful of surgical procedures.

2. The operation is without risk to life in the case of a patient without disease of vital organs.

3. That it is well adapted to the military service.

4. That no soldier otherwise sound should be discharged from service on account of varicocele.

5. That it should be the duty of the Medical Department of the Army to cure these cases, compelling compliance on the part of the soldier where objection is urged.

*Report of Capt. W. C. Borden, Assistant Surgeon U. S. Army,
U. S. General Hospital, Washington Barracks, D. C., Feb-
ruary, 9, 1901.*

I have operated for varicocele in twenty-two cases and have used two methods—subcutaneous ligation and excision. The cases by subcutaneous ligation were thirteen in number and were done several years ago. This method I no longer consider worthy of consideration as it has been entirely superseded by the more accurate and satisfactory method of operation by excision.

Operation by the open method with excision of the veins.—In operating by this method one of two incisions may be practiced—above the pubes over the external inguinal ring or through the front of the scrotum. I have used both incisions, having operated about an equal number of times by each and believe the suprapubic method to be by far the safer for general work but in certain cases, where the scrotum is quite long and relaxed, I prefer the incision through the scrotum when I am absolutely sure of my asepsis. The operation for varicocele is one which requires extreme care in the aseptic technic and this is particularly the case if the operation is done through the scrotum as the laxity of the tissues, the deep rugae of the skin, and the deep sebaceous glands in this region tend to harbor infection which, if it occurs, is invariably followed by prolonged suppuration and sinuses which have no tendency to heal thus necessitating a secondary operation. Aside from the prolonged suppuration which follows infection, this is dangerous to the testicle in that the inflam-

mation about the blood vessels may seriously interfere with the organ or may even infect it and produce atrophy.

In my nineteen cases operated upon by the open method primary union was obtained in all but one case. This case was operated upon by the scrotal route. It occurred at this hospital and was the first surgical case I operated on here. At that time the conditions were not favorable to absolute aseptic work and this, in connection with the incision through the scrotum, accounted for the infection. Fortunately the infection was not severe and I am inclined to believe that, other conditions being equal, had the operation been done by the suprapubic route no infection would have occurred. With asepsis thoroughly under control the scrotal route may be chosen in certain selected cases especially in those in which the scrotum is elongated, for by sewing the incision transversely the scrotum may be shortened. But as the main danger in the operation for varicocele arises from infection of the wound the suprapubic method is to be preferred when most rigid asepsis is required.

Aseptic technic.—The patient is prepared by shaving the pubes, scrotum and adjacent parts and applying a dressing of green soap the night before the operation. Green soap is preferred to a bichloride dressing in that it loosens the epidermis and allows a thorough cleansing. The patient having been placed under an anesthetic the parts are thoroughly scrubbed with green soap. They are then rinsed with sterile water, scrubbed with alcohol, then with bichloride solution 1:1000 and rinsed with sterile water. The penis is carefully enveloped in a sterile cloth and the operator and his assistants all wear rubber gloves. I now use rubber gloves in all my operations and consider them of the greatest value in furthering asepsis.

The operation by the suprapubic route.—The incision is made above the pubes and over the external inguinal ring, nearly parallel to Poupart's ligament and about an inch and one-half in length. It is carried down until the external ring is exposed and the cord brought into view. The sheath of the cord is now opened and the veins which lie at the anterior portion of the cord are seen. In varicocele the enlarged veins lie at the anterior part of the cord and in front of the vas deferens and spermatic artery. If care be taken these veins can be lifted up and away from the vas deferens and artery and isolated from the latter by passing a blunt hook beneath them. Having done this the veins can be separated by blunt dissection from the underlying structure of the cord well down to-

ward the testicle by pulling them up as the dissection proceeds. Having done this, the operator should determine the position of the vas deferens and artery to be sure that he does not include them in his ligature. The veins being brought well out through the incision a ligature is passed about them above and another ligature is tied about them below well down toward the testicle. The intervening portion is excised and the cut ends approximated and tied together by the ligatures. The wound is now closed by a subcuticular suture of catgut, covered with sterile gauze, cotton and a spica bandage.

Dangers of the operation.—The danger of infection has already been discussed. The remaining danger is atrophy of the testicle from inclusion of the vas deferens or spermatic artery in the ligatures. This the operator must be careful to avoid and is easily done by careful attention to the structures involved before the ligature is passed.

Operation by the scrotal route.—As before stated, this operation is not advised except in special cases and when the operator is absolutely sure of his aseptic technic. The operator standing on the left of the patient grasps the cord between the thumb and forefinger of his left hand, pressing the cord up to the anterior surface of the scrotum and holding the testicle retracted in the palm of his hand. Holding the knife in his right hand, he makes an incision about an inch long through the skin and cuts carefully down to the cord which he is pressing upward with the left thumb and forefinger. By holding the cord firmly to the front of the scrotum in the manner indicated and cutting carefully the distended veins are soon brought into view and this with much less dissection and consequent disturbance of the tissues than occurs when the incision is made into the body of the scrotum and the cord searched for. The veins having been brought into view the operator, still holding the cord to the front with his thumb and forefinger, frees them to a sufficient extent to pull the cord out of the incision. Having done this he holds aside the vas deferens and separates it from the enlarged veins. The most difficult part of the operation now begins. The operator grasping the cord feels for the pulsation of the artery and, having found it, dissects the artery free from the veins. This is sometimes quite difficult and troublesome to do, but the artery should by no means be included in the ligature with the veins as atrophy of the testicle will very probably result. Having separated the vas deferens and artery from the veins, the latter are freed well down to the testicle and well up to the external inguinal ring. A catgut ligature

is then passed around the veins above and tied, the ends of the ligature not being cut off. The veins are ligated below in a similar manner and the part between the stumps excised. The stumps are approximated and tied together, using the ends of the ligature for this purpose. This raises the testicle higher in the scrotum than it was before the operation and does away with the sagging of the organ. The skin wound is closed by subcuticular catgut suture or with interrupted suture or horsehair. A dressing of sterile gauze covered with absorbent cotton is placed over the closed wound and a suitable bandage is applied.

Results of operations.—The results of the operation are always good, provided it is done aseptically and the operator does not include the vas deferens or spermatic artery in his ligature. In my nineteen cases I had one infection which, as stated before, was slight and did not lead to any serious trouble. So far as I know there was no atrophy of the testicle in any case and cure was radical in all.

General conclusions.—As a result of my experience I am of the opinion that a varicocele which produces disability and which has originated in the service should not be considered a cause for a discharge, but should always be operated upon provided the operator is so situated that he can be reasonably sure of asepsis.

*Report of Capt. A. E. Bradley, Assistant Surgeon U. S. Army,
Fort Snelling, Minn., December 22, 1900.*

A description of the method of operation in these cases cannot be found in any text book available, but I am not prepared to claim that it is new. I was prompted to employ it in the first instance in the case of a soldier concerning whom the surgeon of his post persistently claimed the existence of hernia. Reports of this case, Private C. R. L., Troop H, 1st Cavalry, were forwarded August 15 and October 26, 1900.

In view of the opinion of the surgeon at Fort Meade, S. Dak., it was deemed advisable to expose the inguinal canal and the abdominal rings and at the same time operate for the varicocele the existence of which was evident. An incision about two inches long was made in the line of the inguinal canal well down towards the base of the penis. The cord was exposed external to the external ring and easily drawn forth with the mass of varicose veins. The testicle itself was drawn out and fully exposed with great ease. The veins were excised, the stumps drawn together shortening the cord and the

testicle replaced. The abdominal rings and the canal were found normal. A few catgut sutures closed the deeper structures and subcuticular silkworm gut sutured the skin incision. A collodion dressing was applied and convalescence was normal.

Case 2.—Trumpeter L. E. S., Troop G, 1st Cavalry, was admitted from Fort Yellowstone, Wyo., October 20, 1900, for operation for varicocele. In view of the ease of operation, as I found it in L's case, I determined to use the same method. The usual preparations were made and I operated October 21, 1900. A small incision was made as before, the cord exposed and dragged up and out, the veins ligated and excised, with out, however, delivering the testicle out of the incision. The wound was closed as in the first case and the result was perfectly satisfactory.

Case 3.—Sergeant J. W. M., Company A, 8th Infantry, was admitted to hospital, October 8, 1900, for chronic sciatica, and while in hospital expressed a desire to be operated upon for varicocele. Operation was performed as in case 2 with a perfect result.

I believe this method to have advantages over the scrotal method. There is greater probability of perfect preparation and less danger of wound infection. The wound is well up on the pubes and away from sources of infection.

The difficulty of avoiding wound infection in scrotal work is well known. Owing to the thin and relaxed wall of the scrotum and the cremaster action, it is difficult to keep perfect apposition of the parts divided in the scrotal operation. In the high operation this is avoided.

Extracts from a paper by Lieut. Col. Nicholas Senn, Chief Surgeon U. S. Vol., chief of operating staff with the army in the field; from his work on the Medico-Surgical Aspects of the Spanish-American War.

For years I have been convinced that too many operations are being performed for varicocele, and I have always advised my students to limit operative intervention to the exceptional cases in which well marked symptoms warranted such a course. Most of the persons suffering from this affection that apply to the surgeon for treatment are sexual neurasthenics, young men who have made a deep study of this subject with the aid of quack literature. In the great majority of cases the symptoms presented are due to a morbid mental condition rather than the varicosity of the spermatic veins. I have frequently

observed that the size of the varicocele bears no relation to the degree of suffering and distress complained of by the patients. Recent experience has only confirmed my views concerning the relationship of varicocele to the subjective symptoms associated with this condition. During the month of May I had, as a member of the examining board, an opportunity to examine, at Camp Tanner, Springfield, Ill., 9,815 recruits for the volunteer service. I took special pains to investigate varicocele as a cause of disability. From the very beginning I was surprised at the prevalence of this affection. I classified the cases according to the number and size of the varicose spermatic veins into (1) small varicocele, (2) medium-sized varicocele, (3) large varicocele. The disease was found more frequent in the robust strong than in men of slight build. In most instances the men were otherwise in excellent condition. Atrophy of the testicle was seldom noted. The subjects of large varicocele were invariably questioned as to whether or not this pathological condition gave rise to discomfort or pain, and, with the exception of three or four cases, the replies were always negative. In more than half the cases that presented themselves the men were ignorant of the existence of the affection. * * * The result of these observations led me to the conclusion that varicocele is very seldom a cause of disability for military service, and that operative treatment is rarely indicated. This short communication is made for the distinct purpose of calling attention to the frequency with which varicocele is met with in otherwise healthy and robust subjects and in formulating a serious and positive protest against the too frequent resource to operative interference so common with surgeons of all grades and in all civilized countries.

The following table shows that of 9,815 recruits examined 2,078 were affected with varicocele, that is, 21.17 per cent. * * * These statistics are absolutely reliable and fortify my position taken in this paper that varicocele in varying degrees is met with in nearly one out of four men between the ages of 18 and 30 years, and that of itself it seldom gives rise to any noticeable disturbance, and that the patients who apply for treatment do so in consequence of nervous disturbances entirely separate and independent of the enlarged spermatic veins. I am satisfied that in many of these cases an operation is superfluous, provided the surgeon can secure the full confidence of the patient, which is an essential prerequisite to successful treatment short of an operation. For

my own part I shall not perform as many operations for varicocele since I have had an opportunity of studying the pathologic and clinical features of this affection on such a large scale.

[Signed]

GEO. M. STERNBERG,

Surgeon General, U. S. Army.

It may be seen that other operators than myself had been using the suprapubic route for varicocele and while it was a new method so far as I was concerned it was originated by some surgeon not known to me. From these reports it will be seen that Colonel Girard has been doing this operation at least since October 10, 1899, and Major Banister since January 10, 1899, while Major Borden gives no dates.

Since this report was published I have operated on four other cases for varicocele by the high operation all giving satisfactory results so far as known. In one case, an officer, in whom I permitted too much freedom after operation there was slow convalescence in which a mass of inflammatory material developed at the site of the excision of the veins and which persisted some time before the patient could be about. This case taught me that quiet should be enforced after the operation and too many liberties early in convalescence, getting up for using the close stool or going to a closet, should be discouraged; the bed pan and urinal should be insisted upon, and quiet in bed enjoined for at least one week.

In one of these four cases there was double hydrocele, small however and not sufficient to ordinarily warrant interference. On the left side after excision of the veins, the testicle and the hydrocele were easily delivered out of the incision and inspected. A small incision was made in the sac, the fluid evacuated and the sac wiped out by a small swab of cotton dipped in pure carbolic acid after which the incision was closed with catgut and the testicle restored to its normal position in the scrotum. The right hydrocele was tapped by a hypodermic needle and the sac walls scarified or scratched with the point of the needle. The patient returned to duty about ten days after operation; the varicocele and the left

hydrocele have been obliterated but fluid has again accumulated in the right sac. Convalescence was normal in this case.

In one case of tubercular testicle I performed castration by the suprapubic method. The testicle was easily delivered through the small incision, and as much of the cord as possible was drawn down before excision. Convalescence was normal and satisfactory in every respect. In this case there was no varicocele but the operation of castration having been proposed to the patient and accepted by him the suprapubic route was chosen as being both feasible and as preferable to the usual scrotal operation.

In another case while performing a Bassini operation the testicle was delivered out of the incision for examination and in many other cases the ease with which delivery could be effected has been demonstrated. In these cases where the testicle is exposed no difficulty whatever has been experienced in reducing it to its normal position. The ease with which it can be exposed and replaced through a small incision was to me at first quite surprising.

After careful aseptic preparation I make an incision above the pubes over the external ring from an inch to an inch and a half long. Before making the incision the cord can be located by palpation and the division of the tissues made directly over it. Ordinarily there is no hemorrhage and the incision is deepened until the sheath of the cord is reached when it is opened. Should any difficulty be experienced in locating the cord it can be readily discerned by passing the tip of a finger in the wound from side to side the cord being thus easily felt. In varicocele the enlarged veins frequently present into the incision and can be picked up, drawn out, isolated and excised without disturbing the vas deferens and spermatic artery which usually lie posterior to the enlarged veins. These veins are separated by blunt dissection and tied off by two catgut ligatures one from half to three-fourths of an inch above the testicle, the other two inches or more above sufficiently to include the mass of veins. The veins thus ligated off are excised and the stumps drawn together by the liga-

tures which are left long for this purpose. After tying the approximation is made more perfect by threading the ends of the ligatures on needles and taking a few continuous sutures. This shortens the cord and supports the testicle. The cord is now replaced in the sheath which is closed by a fine catgut continuous suture; the deeper tissues are approximated by continuous catgut and the skin by subcuticular silk worm gut, a sterile cotton collodion dressing is applied and the scrotum supported by a suspensory bandage. In a week the dressing is removed, the silk worm suture is taken out and the suspensory worn some time thereafter for support. If the operation is made for some condition other than varicocele the contents of the scrotum can easily be reached after the sheath of the cord has been opened. By taking the scrotum between the thumb and tips of the fingers gentle taxis and upward pressure will cause the testicle to present into or out of the wound as may be desired.

All the arguments used in the reports above quoted for varicocele hold equally good, in my opinion, for any operation on the contents of the scrotum, and I believe that the suprapubic or high operation is destined to supersede the scrotal or low operation in most of these cases.

As the operation for varicocele is so successful and without danger to persons otherwise in good health, I believe that no recruit should be rejected for the services for this defect. Let its nature be explained to him and let him agree to accept operation should it be deemed necessary after he enters the service. Many young men otherwise desirable recruits are lost to the services because of this defect who would undoubtedly accept operation for its correction and no one once in the service should be discharged because of it.

Fort Snelling, Minnesota,
May, 1901.

DISCUSSION.

MAJ. T. C. CLARK, Minn.—I think all surgeons who have had occasion to examine recruits for the regular service in the

late war will agree with me that there was a surprisingly large percentage that had to be rejected. To me, at least, it was a matter of surprise. I remember the case of a young man who was an athlete and a director of athletics by profession, and he was almost heartbroken because he could not go. I told him if he would go to the hospital for treatment he might be able to go if a regiment was formed later. He took my advice and went out with a later regiment. I agree with the plea made by Maj. Bradley that the operation should be made at the government hospital, because it is an operation that is usually successful and there is little danger to the individual from infection, and a man that was otherwise acceptable would make a good recruit. The experiences of surgeons are such that I think the government should revise its requirements and accept a man who was otherwise acceptable and have him operated upon. I remember a number of cases I was obliged to reject for the service that in every other respect would have made first class soldiers, and I think exception should be made in the case of such recruits with the understanding that they be operated upon and have it done immediately. I think the result would be the acceptance of a great many good men now rejected on that score. I believe this is a very practical matter for this Association to take up.

LIEUT. COL. J. D. GRIFFITH, Mo.—The operative interference we have had so fully described in this complete paper is a subject of great importance, and I think we should certainly discuss the question as to whether a soldier with an ordinary varicocele should be refused admission to the army. As to the operation above the pubis, I do not think it is as yet a settled one. Some reasons why it is not yet generally accepted are these: Whenever you destroy or open up one of the cavities of the inguinal canal you have to sew it together again, and remember you weaken the walls of the abdomen where you already have a weak place. It is a question whether or not it is not better to run the risk of not being able to completely sterilize the skin of the scrotum and take the chances with the catgut for ligation. For years I have ligated the veins just below the external ring, and ligated them further down, one and one-half to two inches, leaving one piece of the string and then laying them together and making with the catgut a suspensory, an automatic suspensory with the cord itself. Ligating and sewing this together with subcutaneous stitches we had no trouble whatever with this method. I think it is to a very great extent due to the cleanliness first of your patient, and then the cleanliness of

the cut and of the scrotum itself. Of course, you can clean the scrotum in a few hours, I admit that; but if you prepare it forty-eight hours before operation, shave it thoroughly, wash it well with soap and have it well sterilized I do not see any reason why you cannot get as good a result as you can by the other operation and you do not weaken the walls of the abdomen.

X COL. E. W. LEE, Neb.—I feel justified in emphasizing in a degree the remarks of Col. Griffith, and especially in this respect that I believe there has been altogether too much pathological importance attributed to varicocele. I believe that if all the gentlemen present would submit to an examination by a man who was very strict in his examination he would condemn ninety-nine per cent of them as victims of varicocele. I think there has been altogether too much importance attributed to its pathological conditions and to its effects. I will admit that I have performed the operation for the radical cure of varicocele a number of times when it was at the solicitation and importunities of patients who had been led to believe they were suffering from a certain incurable disease from accounts they had seen somewhere in medical advertisements. These simple conditions have been so impressed upon the minds of a great many individuals that they suffer a great many inconveniences and perturbations of mind and body from a cause that really does not exist. They see advertised in the papers a sure cure for varicocele, hydrocele and all that sort of thing to the extent that they go to the physician and implore his aid, and often as a relief for the mental suffering the surgeon is persuaded to perform an operation. The operation that I was first taught to do and the operation I did do was to remove all the redundant scrotum, shortening the long scrotum and thereby producing a natural support, making a natural suspensory bandage, and we all know that varicocele in a great many cases passes away and subsides by wearing a suspensory bandage. The operation I first performed was the removal of the redundant scrotum, making a natural suspensory bandage which took the strain off the vessels of the cord and consequently relieved the extension, and in due time the varicocele subsided to a great extent. The operation I have performed in recent years is the scrotal operation. It is a simple incision in the scrotum and the removal of the dilated vessels of the pampiniform plexus, being careful not to include the vas deferens and veins of the cord. I prefer this to the high suprapubic operation simply because I believe to a certain extent the suprapubic operation weakens what we term the ingui-

nal tract or the inguinal canal. There is only one objection to the operation on the scrotum, and that is that invariably we can get a better union above Poupart's ligament than we can in the scrotum but we can get a perfect union in the scrotum if we are careful of the manner in which we apply our sutures and the manner in which we bring our tissues into contact. If we are careful to bring our tissues into perfect contact we can get an absolutely perfect union. The natural tendency of scrotal tissue is to contract, but if care is taken the scrotal tissue can be brought into apposition and united and held there if the proper suture is applied, and the suture I have used is very close, an interrupted suture. If we give it a continuous suture we are liable to corrugate it, liable to mangle it, but I believe the proper suture is the interrupted suture placed very near together.

BRIG. GEN. F. W. BYERS, Wis.—I do not propose to take up the question of operation for varicocele, but I wish to state here that I believe varicocele should be a bar to enlistment in the volunteer service. From an experience of thirty years as an examining surgeon I will state to the gentlemen that they have no idea how many applications for pensions there are for some disability always and invariably claimed as the result of varicocele; and I think in the examination for enlistment in the national guards of the various states, and for enlistment in the volunteer service no one should be permitted to serve as a volunteer or member of the national guard who has any complication of that character. You will bear me out in the statement in your own experience that the enlisted man in the volunteer service if he has a trouble of this kind always has a standing excuse when he has a disagreeable duty to perform, and when he tells his Captain or surgeon that he has varicocele he is excused from the most important duty that the enlisted man is required to do, and I would suggest to the gentlemen of this organization, both in the volunteer and the national guard service, that whenever a man comes up for enlistment that has any disability of that character reject him. In the pension department today there is scarcely an examination made in any part of the country but some fellow comes up with some claim for varicocele or disease of the scrotum, and I would suggest, gentlemen, that although a man may be physically perfect in every other respect, if there is any sort of hernial or scrotal trouble set the man aside and tell him he is not going to be accepted.

COL. R. HARVEY REED, Wyo.—The question that has been

so ably discussed by Major Bradley is one of very great importance, as we all know the frequency of varicocele, and I agree with Dr. Lee that a great deal of this is a mere figment of the imagination, in some people at least, but I also agree with General Byers that it should be a bar to enlistment in the army. If a man with varicocele is going to be admitted let him be operated upon before we take him, for if we take him he is liable afterwards to claim a pension for disability on that account.

As to the operation for varicocele, I do not think it is any more frequent in my section of the country than in others, but I am placed in a position where I make a great many operations for varicocele every year, and I feel, while the paper is a valuable one, I cannot consent to the idea of the suprapubic operation being the superior one. I know no reason why the scrotum cannot be cleansed as well as any other part of the body, and as for the operation, I saw way back in years gone by an operation made by old Dr. Craig who ligated the veins with a hemp ligature. I have seen many operations and I do not advise the subcutaneous at all, but I think the simple operation of cutting into the side of the scrotum and excising these varicose veins is as good an operation as I want. It was stated by the essayist that we had no atrophy of the testicle with the suprapubic operation. I do not see any reason why we should not have it with one operation as well as another. If I exclude the artery, the vas deferens, I cannot understand that we will have trouble, and I have made several operations with other surgeons and made that operation and found where the artery was properly excluded the results were better than if done by the suprapubic operation. I do not see that that argument stands in the way at all. I do not expect a patient to stay in the hospital to exceed ten days. A week to ten days is the usual time the patient is in the hospital when I operate for varicocele, and it is the exception to the rule when a case goes over ten days. In that time I usually have the patient discharged and healing by first intention. It is a simple operation, simply to cut into the skin and ligate with an aseptic ligature. I use a catgut that has recently been brought out by Dr. Boeckman of this city, and who recently wrote me that he believed it to be anti-pyogenic. I prefer to use that and have no trouble with the operation. There is no danger. I have had no case during the last four years of atrophy and no trouble with the testicle whatever. I do say if we are going to admit soldiers with varicocele operate first.

LIEUT. R. K. HUTCHINGS, Colo.—In regard to the statement made concerning the claims that appear before the pension board on account of this trouble, I am examiner of the pension board at Colorado Springs, and yet I have to find the man that has a disability from varicocele. Most all of them claim to have, but we examine them and we find there is no real disability from it.

In regard to the operation, I prefer to operate through the scrotum. I never tried the suprapubic, but I find the scrotal method eminently satisfactory, and why an otherwise strong and healthy man should be kept out of the service is a reason that looks to me uncalled for. Now it is true, as our friend Gen. Byers says, that they will make such claims, but it looks to me as though in the service the responsibility lies with the doctor. Why do we have medical examiners? Why do we have surgeons in the service? They are the ones to tell the men in power whether these men applying for admission to the army are disabled or not. It is really catering to the quacks. They advertise all these things and they get men to believe they are troubled with this disease and many other diseases which have no bearing on their health. If a man claims he has varicocele and is disabled, the thing to do is to turn him over to the regimental surgeon; that settles the matter. If he is the right kind of a man, which we know he is, he will tell whether that man is disabled or not disabled. It is "up to" the doctor. But I have yet to find the man applying for a pension from varicocele that is really disabled from that and that alone.

COL. W. W. GRANT, Colo.—There is another feature in this matter of varicocele and diseases of that nature. I have found in cases of chronic hemorrhoids a marked mental depression present in many cases. It unfits a man for the life of an ordinary soldier or civilian. I have found him suffering greatly mentally when all that was the matter with him was varicocele. My operation, it seems to me, is a logical one, and it is the suprapubic instead of the scrotal. I do not fear to cut in on account of any danger because it is a simple operation. I have no trouble in cutting above the pubis. All that is necessary is to excise the veins and bring them together and shorten the scrotum, and in a few months the patient will be well. There can be no objection to this and there is no danger of infection.

LIEUT. COL. JOHN VAN. R. HOFF, U. S. A.—One day in a clinic given by Dr. McBurney of New York, he presented a case

of radical cure for varicocele. He said the young man was a candidate for admission to the military academy and the military academy demanded that no man be admitted to the academy or to the army who had varicocele of any importance. Maj. Bradley has also quoted the requirements of the army that no man should be passed who had varicocele of any importance. Whether or not there ever has been a case of disability due to varicocele, of course, you gentlemen are quite as competent to say as I am. I know from my own experience in the service that there are a great many men who have claimed to be disabled by reason of that disease. I know a great many that have been passed with varicocele who said at the time of examination they did not know they had varicocele, who were taken into the service, and in four weeks they did not report on account of varicocele. Who can say whether or not those men lied. The gentleman from Colorado said it was "up to the doctor." It is "up to the doctor." Can he say these men are diseased? I believe we have to take the safe side. We are certain as the day follows night that there will come a time, even if that man has gone through the service and made a good record, when he will appear as an applicant for a pension. One of the most important duties the medical officer has to perform today is to protect the United States treasury.

MAJOR T. C. CLARK, Minn.—I want to raise the point that as long as the requirements are as strict as laid down in the Manual, and as long as this warlike spirit continues, you will find thousands of men troubled with varicocele, and you will find thousands of men not barred out; the surgeon will put down in the examination paper that the man has varicocele, but the man is needed and the disease is not of much importance and it will not keep him out of the service. But so long as it does not exclude men from volunteer service you will find examining surgeons passing these men. As my colleagues said to me, they considered it of minor importance, but you will find thousands of men enrolled who will afterwards apply for a pension. It is a rule that cannot be enforced. It is better to have the state exclude him for varicocele than to have him appear a few months later as an applicant for a pension on account of varicocele. I think Col. Hoff will agree with me that no government in the world has such strict requirements as the United States. Where would Germany get her soldiers if her requirements were as strict as ours? and you will admit that Germany has good soldiers. Men are permitted to lay a foundation for pension

claims afterwards by the disinclination of the examining surgeon to exclude them for a disability he considers of minor importance.

MAJ. GEO. HALLEY, Mo.—I think there is but little doubt (there is none in my mind, at least) that every man with varicocele is physiologically not a perfect individual. His imperfection consists in the structure of his veins. Every individual suffering with varicocele has vessels that will not bear ordinary tension, therefore I take it that pathologically and physiologically he is an imperfect individual and should not be accepted. With reference to the operation, the suprapubic is the only operation I have ever done. I never tie without cutting down to see what I am tying. I was always afraid of the other. I do not hold that there is no man on the face of the earth who can take up all those arteries without making that incision. I have been doing this operation for twenty-five years, and I have a record of some sixty-seven or sixty-eight that I have done. I used to do the operation by incising through the upper part of the scrotum, but for the last ten years I have invariably made the incision above the pubes, because I can get at it better and tie the veins easier. One point that has not been mentioned, and one of the difficulties I have encountered in high operations and to which I now pay very careful attention, is to very securely tie the lower end of the veins. At first I used to ligate the veins continuously and not cut them off, but I found in a good many cases the condition returned. I get them out now, separate the veins at the lower end toward the testicle and tie them securely, and as long as the catgut holds you will have no hemorrhage. The ligation above is a very minor matter and can be any kind of a cord around there. Of course, it has to be done in a thoroughly aseptic manner as described. Those are about the only points of importance. I never had but one case in which there was any difficulty with the vein, and then I accidentally pulled up the spermatic artery, and then, of course, I castrated right away. I ligated the artery and found I had cut it. It was a very bad case of enormous vessels, and I do not think the testicle was of any great use to the man because it was almost completely absorbed.

With reference to the size, I think the size of the varicocele should cut no figure in the acceptance or rejection of a man. You might as well say that a man with one or two nodules on his leg or small varicose veins should not be ac-

cepted. The pathological conditions will develop as soon as a strain is put on the veins.

P. A. SURG. C. P. WERTENBAKER, U. S. M. H. S.—I have had a great deal of experience during the past fourteen years in the examination of life-saving service recruits who are exposed to a great deal of strain. Men who enter that service must be absolutely physically perfect, otherwise under strain, excitement, storm and water in the pursuance of their work they could not stand the strain; therefore they must be physically perfect. I have examined a good many men who have had varicocele. The experience that I have had has taught me that ordinarily varicocele does not interfere with a man's work. I think we may assume that a man with varicocele is normal. I do not know what the percentage of varicocele is, but a slight varicocele exists in at least seventy-five per cent of men, and it has been my individual practice to pass men with slight varicocele, noting that fact on their examination papers. I only mention this fact as a contribution to the general consensus of opinion in regard to the matter. Doubtless the fact may be of interest, because life saving men are subjected to a continuous strain for many hours. It is the duty of the examining surgeon to ascertain whether the man can stand that strain for any length of time. It has been the custom in the marine hospital service to reject men with a hernia because I believe that some moment when under severe strain he might give way, but for varicocele it has been my individual custom and the custom of the service unless it was very large, to pass the man. I believe you will find that varicocele is a normal condition in nine-tenths of the individuals that are brought under examination.

BRIG. GEN. JAMES T. PRIESTLEY, Ia.—The point the writer wishes to make is that the suprapubic operation can be performed as well as the scrotal. He is doubtless right. I have never done the suprapubic operation until of late years. I have made many through the scrotum, tying off the veins and shortening the scrotum. Whenever I have operated for hernia and found a varicocele I have tied off the veins through the hernial incision. My percentage of complete suprapubic operations is much better than the scrotal. I have had infection through the scrotum, but never through a good, clean suprapubic operation.

DR. CHRISTIAN FENGER, Illinois.—Whether this is a normal condition is a question that comes to my mind. In the hospital we do not see many old men with varicocele;

it is a condition that usually disappears in middle life, and that would speak against its being a disease of a progressive character as many other diseases are. In our clinics there are a good many patients with varicocele that we send away and tell them that it is unnecessary to operate upon them. They have been scared by quacks and pamphlets sent out by such people, but we tell them they must be patient and that there is no cause for alarm. As far as the military service is concerned I have no experience in that direction.

P. A. SURG. C. P. WERTENBAKER, U. S. M. H. S.—That is my experience. Varicocele does not progress. At this point I would like to say that varicocele in men between twenty-five and thirty does not progress, therefore you can count its limit. I believe I have Dr. Fenger's word for that.

MAJ. ALFRED E. BRADLEY, U. S. A.—My object in presenting the paper was to show that to my mind at least, the suprapubic operation was the safer operation. I have done both the scrotal and the suprapubic. It was brought out in the discussion that it would weaken the abdominal wall. The incision I make is well down towards the base of the penis in the external abdominal ring, and I find it does not weaken the wall in any way. The incision is a small one, usually an inch is sufficient. The reason the circular I referred to was published by the Surgeon General of the Army was because so many cases were coming in requesting discharge for disability on account of varicocele, and the ground was taken that it was not a disability for which discharge should be given, that they were proper cases for operation and restoration to duty. I think Dr. Wertenbaker mentioned that he concluded that nine-tenths of the men were troubled with varicocele and therefore considered it a pathological condition. During the war Dr. Senn was on duty at Springfield, and there he examined 9815 recruits for the volunteer service. He took exceptional pains to investigate varicocele. He was surprised at the prevalence of the affection. He classified them as small, medium and large varicocele. The disease was more frequent in robust men than in slightly built men. Atrophy of the testicle was seldom noted. He goes on to show that of the 9815 recruits 2078 were affected with varicocele, or 21.17 per cent.

COL. EDWARD W. LEE, Neb.—Those 21 per cent were not excluded on account of that condition?

MAJ. A. E. BRADLEY, U. S. A.—I think it was attempted simply to show the number that had varicocele; not those that were rejected.

OBSERVATIONS IN CHINA AND THE TROPICS ON
THE ARMY RATION AND THE POST
EXCHANGE OR CANTEEN.

By MAJOR LOUIS LIVINGSTON SEAMAN, M. D., L. L. B.

NEW YORK CITY.

SURGEON, FIRST UNITED STATES VOLUNTEER ENGINEERS.

UNITED STATES Military Hospital No. 1 at Camp Reilly, Peking, occupies one of the many compounds of the Temple of Agriculture, one of the most sacred and classic spots in the Celestial Empire. It is here that the "Son of Heaven", attended by high religious functionaries, comes annually in great pomp and splendor, on the Chinese New Year (corresponding with our 19th of February) to break the soil with his own hands, and to pray to the gods of air and water, that sunshine and rain may bring bounteous crops to his land, and that prosperity and happiness may thereby come to his people. For reasons unnecessary to mention, for the first time in centuries, this beautiful and poetical ceremony, was this year omitted. Occidental ideas in the way of punitive expeditions, revenge, lootings, ravishings, pillagings, the torch, drowning by thousands (twelve thousand innocents in one day driven into the Amur River at Blagoveshinski), being some of the methods now in vogue, for impressing a "higher civilization" on this unhappy land. But, as Kipling might say, "this is another story", only, it may be added with patriotic pride, General Chaffee and the American forces were not participants in these acts of vandalism. They never forgot the laws of honorable warfare, and no deed can be attributed to them, that will tarnish the bright escutcheon of this great Republic.

There is but one style of architecture in China, and its type never becomes monotonous because it is so artistically perfect. The larger temples, notably those in the Forbidden City, the Ming Tombs, and those in the Compounds of "Ag-

riculture" and "Heaven" are built on a raised dais of granite or marble masonry. They have neither basement nor gallery. The curved overhanging tiled roof is supported by almost windowless walls, save for here and there latticed openings, and by massive columns of wood with heavy crossbeams. The splendor of the interior decorations is dazzling. Red in lacquer is the prevailing tint of the walls, while the monster crossbeams and ceiling are covered with innumerable dragons in gold and silver, on a frescoed background of green and blue. It is in such a building of splendid magnificence that the Medical Staff of "The Chinese Relief Expedition" has quartered itself, and where, by invitation, I found myself most pleasantly billeted for nearly two months of the past winter. The floor space of the Temple being greater than was needed by the staff, one end was partitioned off as a dispensary, but the principal medical supplies were housed in a separate building. Flanking the main Temple on either side of the compound are two others, one used as a recreation hall for the soldiers, the other as a hospital, with abundance of room for medical, surgical and venereal wards, together with operating rooms and nurses' quarters. Both Hospital Corps men and trained female nurses are in attendance, and an extra diet kitchen supplies many delicacies. The service, under Major Ives, is most admirably conducted by Lieut. Greenleaf and his able assistants, and the results obtained compare favorably with those of our best hospitals at home.

The "Report of Vital Statistics and Diseases" for the week ending February 9th, 1901, for the troops stationed at Peking, shows the mean strength of the command, including officers and men, of 1559 with a total sick list of 80, or 5.1 per cent.

The class of cases are of the nature usually found in a military hospital in America. Of the 80, 13 are diagnosed as suffering from "respiratory diseases", 5 from "accidents or injuries," 4 from "malarial fever", 1 from "typhoid", 3 from "digestive diseases", 2 unclassified, 11 as "circulatory",

"muscular", "cutaneous", "special sense" "nervous" and other diseases, and 41 as "venereal".

The climate of Peking in winter is cold, dry and clear, ranging in January from 30° Fahrenheit, to ten below zero, without a storm during the month, except the wind, which often blows a gale, driving the dust in blinding clouds. Any-one who has ever experienced a Peking dust-storm will never want to repeat it; he will find that inhalations of ancestral dust are not conducive to healthful respiration. It is not surprising, therefore, that a rather large proportion of cases should be found under the heading of "Respiratory Diseases", especially when it is remembered that the troops prior to their arrival in China had served nearly two years in the tropical Philippines. They were the only ones of the Allied Army quartered in tents (Sibleys) and pneumonia was the most dreaded enemy. You will observe in the list enumerated there is but one case of typhoid fever. In this connection, it is interesting to note, that, on their arrival in China, it was the boast of the Medical Officers of the German Army, that "typhus" fever, (our typhoid or enteric) and "dysentery", were comparatively unknown visitors to their camps. Criticisms of the losses of the American Army from these causes during the Spanish-American war by our Teutonic colleagues are not yet forgotten, and perhaps the lesson to the Americans has not been without benefit. At any rate, within two months of the arrival of the German army in China, its hospitals contained over 500 cases of typhoid fever, followed by an appalling list of fatalities, while the wards of the American hospitals were, and are still, singularly free. I found but one case either in Tien Tsin or Peking and this man was a convalescent, while the number in the German wards still remains in the hundreds. The Americans have six water-distilling plants, while our neighbors have none, and therein undoubtedly lies one of the potent reasons for this remarkable contrast. Indeed, it may be added, the Americans had the only water-distilling plant in operation in Peking. Its capacity was so much greater than the require-

ments of our Army, that two tons of the surplus water was donated by the hospital department to the Japanese Army every day of the winter. The American Quartermaster (Major Byron) also cut and stored 800 tons of ice in Peking, at a cost of 1250 Mexican dollars. It was the only ice ever housed in that ancient city, and curious bodies of natives used to gather around the camp to watch the novel work of the "foreign devils" and coolies.

It was indeed most gratifying, after spending a fair share of time during the past three years in the Military Hospitals of Porto Rico, Cuba and the Philipines, where a vast majority of the patients were suffering from preventable diseases—diseases resulting from blunders and ignorance—to make a tour through the wards at Camp Reilly, and to note the distinctly different types of cases. The low percentage of all illnesses, except venereal, and especially the almost total absence of the class termed "digestive diseases" offer a startling contrast to conditions existing during the Spanish-American War in Porto Rico or Cuba. There I have seen as high as 75 per cent. of a command suffering from these diseases at one time. Or in the Philippines, where despite the constant depletion of the wards by death, or hospital ships, or U. S. Army transports, carrying from a hundred to five hundred invalided or convalescent men home per month, the percentage of these cases remains persistently high. One naturally looks sharply for the cause of this startling difference, a difference from $\frac{1}{200}$ of 1 per cent., to 75 per cent. A glance at the men at their mess and a consideration of their environment discloses the secret. What appetites—what digestions! You would not believe these men were the emaciated sallow-cheeked troops who came as the American Army from the Philippines last summer. But they are. Here in this invigorating zero temperature, where animal heat is rapidly radiated and where nutritious foods, rich in fats and carbon, are requisite to maintain the body's temperature, the men show evidences of splendid health. It is not my purpose in the limited scope of this paper to review the merits of different foods, more than to

briefly call attention to the dietetic value of sugar as a producer of energy, or the elaborate experiments of Mosso, who with the ergostat, demonstrated that much less muscular deterioration occurred under a sugar diet; and that when muscles were fatigued and incapable of further work, sugar, a pure carbohydrate, most quickly restored their tone; nor even to recall the elaborate tables of Ranke who long ago demonstrated that four-fifths of the food consumed by the average laborer goes to the production of animal heat. In China, heat-producing foods were needed. Even our full Army ration, the richest and most varied in the world, and the envy of every soldier of the allied armies in China, was not found sufficient to satisfy the cravings of the men. Repeatedly, officers have told me their "company funds" were largely depleted by the constant demands of the men for extra allowances. Their appetites were enormous, their food was digested, assimilated and metabolized. The energy of their systems was not consumed in an effort to eliminate these heat-producing foods, as was the case when they were in the tropics where they lived in an environment of heat, and where such foods were superfluous or inappropriate, and therefore were not digested or metabolized. Under these conditions such foods rapidly undergo decomposition in the intestinal tract and create toxines, which Nature endeavors to eliminate as quickly as possible by establishing catarrhs and diarrhoea, as the only method left to rid herself of such irritants.

And yet Congress has just decreed that no change shall be made in the U. S. Army Ration—that it shall remain practically the same at the Pole as at the Equator. Fortunate indeed it is, that the soldier has learned, even though by bitter experience, that this is insanity. He sells his "sow-belly" and "salt-horse" when opportunity offers, and buys in exchange chicken or rice or fish or fruits and sweets, which are usually to be had in abundance in the Tropics. The advocate of the present regime interrupts with: "He could always sell or commute his ration." Yes, provided he always had a market with him on his "hikes", but those who have served with him

in a hostile country, or on the firing line, where he most needs a proper diet, know much better. The impartial and scientific observer sees in this answer only the bureaucrat's subterfuge, dictated by a spirit of ignorance or obstinacy, and resistance to change from established routine, and a lack of courage to shoulder responsibility for fatal blunders that have long crowded our tropic hospitals and made the mournful notes of "taps" so familiar in the land. Let it not be forgotten that in the Spanish-American War, the actual hostilities of which lasted for only six weeks, there were fifteen fatalities from disease (practically all preventable) for one from bullets and wounds. With the passing of Algerism and Eganism it is hoped that some improvement might follow, but it seems we are still doomed to delay.

If any vindication were necessary for the theory for regulating the ration of an army to suit climatic conditions, unanswerable proof can be found in Peking, in the study of the statistics of every company serving in the Chinese Expedition. At my earnest solicitation Captain Anderson commanding Company A, Ninth U. S. Infantry obtained the following figures for me. His command, now numbering 85, came from Manila to China with the first American troops landing at Taku last June. At that time 29, or 33 per cent., of the men were suffering from chronic diarrhoea contracted in the Philippines. On their arrival in China the combined weight of the Company was 12304 pounds. (I have the individual figures). On February the 15th, 1901, these same men weighed 13284 or an average gain of about 13½ pounds. There was not a case of so-called "digestive disease" in the Company nor a man in the hospital. On the contrary, to illustrate the state of the men's digestive ability, the Captain adds:

"During the month of January, 1901, the following extra commissary supplies were used by my Company:

- 3 bbls. (78 gals) pickles.
- 240 cans cream.
- 240 lbs. oatmeal.
- 75 lbs. maccaroni.

60 lbs. cheese.
75 lbs. onions.
12 lbs. baking powder.
2 gals. syrup.
117 rations of bread.
127 lbs. beef.

Total cost of extra \$93.30 and paid from the Company Fund."

The reason for this remarkable difference lies in the changed climatic conditions, the extreme winter temperature of Peking being fully 100° F. lower than that of Manila; in Peking this rich ration is requisite for the proper nourishment of the system.

As further bearing upon this point, let me submit the testimony of a witness, our American Consul at Formosa, whose opportunities for personal observation on this most important subject have rarely if ever been surpassed. His letter is better reading than medical statistics.

"DEAR MAJOR SEAMAN:

"I have perused your very interesting pamphlet on the Army Ration, and the following personal observations may be of some interest to you. As you are aware, I have had rather an unusual opportunity of confirming your statements on the subject of diet. The years 1893 and 1894, as a member of the Peary Arctic Expedition, were spent in North Greenland, within the Arctic Circle. On returning from this trip, I departed almost immediately for Formosa, which is within the tropics, and called the most deadly climate in Asia, and the last six years have been spent in this island.

"In North Greenland our supplies were naturally limited to most portable foods, delicacies were left at home and we did not always have as much in quantity as we wished. It is not strange, therefore, that we, as young men, sometimes turned from our dry pemmican and biscuits, to discuss the probable joys, from a culinary standpoint, awaiting us on our return to the States. You will doubtless surmise that oyster stews, roast turkeys, or pies "like mother used to make" were the subject of our discussion. These we could give warm welcome, still they were far from that glorious dish for which

we all yearned and I might say, almost prayed—it was nothing more than a *side of bacon*. Not the streaky article marked "prime," but the kind that is practically solid fat, and which the butcher in the temperate zone usually throws in the lard pot. We wished no side dishes, and even the cooking did not worry us much; in fact, I believe we would have preferred it merely warmed. On an occasional trip to the southern headquarters we were sometimes the recipients of a thin slice or so dealt out from our slender stock. And how good it was! There was nothing that could approach it. On one occasion I was fortunate, at least I looked upon it in that light then, to obtain out of meal hours from the cook the outer skin or end piece of a side of bacon. I immediately sought the seclusion of my room, warmed it slightly over the flame of my candle, and then ate it with all the pleasure that a young boy obtains from his favorite confectionery.

"Before our return from Greenland, I arranged with my room-mate, that on our arrival at St. Johns, the first port on our downward journey, we should go together to the leading grocery, which we had visited on our upward journey, and purchase a side of bacon. This we would take quietly to the hotel, and for once have simply all the bacon we wished. Of course on our actual arrival at St. Johns, the subject of bacon never entered our heads. We had entered the temperate zone, our systems ceased to call for fat, and we were prepared to give warm welcome to dishes of quite a different nature. This appetite for fat and fatty meats so keen in the far North, is merely Nature's call for help in repelling the almost overpowering cold, and if it is answered there is but little fear of disease. There is probably not a healthier race on earth than the Eskimo of these regions, and our party suffered not the slightest indisposition while there. Yet the same diet in the tropics would be absolutely fatal.

"In tropical Formosa, the idea of fat bacon was as repulsive as it was entrancing in the North. There, did I think of home delicacies, it was the splendid fruits, the strawberries, the luscious peaches that interested me. Nature had given me new tastes, new fancies, an appetite for something that would induce energy, without heat. If we were wise and obeyed her and left aside intoxicants and heavy fatty meats, we found our life a pleasant and not unhealthy one. And, although Formosa has the reputation of being the unhealthiest spot in Asia, I am convinced from my own experience of six years that one who is careful in one's diet, selecting only the foods

which will tend to assist Nature rather than oppose it, will find life quite as healthy in Formosa as they will out of it, assuming of course, that they live in suitable quarters raised above the ground, and protect themselves against the mid-day sun when in the open.

In 1892, on my departure for Greenland, I weighed one hundred and forty-eight pounds, after six weeks of Arctic life on a suitable diet my weight increased to one hundred and ninety pounds. During several months' confinement with a frozen foot I lost heavily, and on my arrival in Formosa in 1894, weighed one hundred and fifty-five pounds. After a six years stay in the island during which I had not had a single sick day, I am now returning to my home land weighing one hundred and ninety-four pounds. The practical diet for a tropical country should, as you suggest, be light meats, chicken, fish, fruits, sugar, tea and rice which are to be found there in abundance. This is what I lived upon. During the two years I was attached to the Imperial Japanese Army, in its campaign against the Chinese rebels in the island, I suffered as severe physical hardships as the average soldier finds in any military campaign in the Tropics. By carefully obeying the dictates of Nature in the selection of foods, I have not—either in Greenland or Formosa suffered, *a single day from sickness*.

"Yours truly,
[Signed] "JAMES W. DAVIDSON, F.R.G.S.
"U. S. Consul for Formosa.

"Yokohama, Japan, March 21st, 1901."

Could any testimony be more convincing? But of what value is the *best* evidence before a court of Congress that would sell its birthright for a mess of pottage, as was done by the last one, in its servile catering for votes, by submitting, against its judgment, to the influence of a lot of fanatical and hysterical women, and abolishing the Army Post Exchange or "Canteen." As you well know, the overwhelming testimony of line and staff officers, men of probity and honor, total abstainers and others, was almost to a man, in favor of the retention of the Post Exchange. It is not my purpose to review the evidence on this subject that was pretty thoroughly threshed during the debate in Congress, but there was one very important factor that was entirely omitted in that discussion, that may furnish a subject for reflection for those who were instrumental in bringing about this lamentable

change. The enemies of the canteen seem to have forgotten that when men accustomed to the use of stimulants are deprived of them, in one way, they will resort to other methods to obtain them. Less than five per cent. of the Army are total abstainers. Soldiers are not prisoners; they are well-paid men and have their pass days. The habits of the vast majority of them were formed long before their enlistment and a large proportion of them belong to the class known as light drinkers. When the soldier cannot obtain a glass of beer or light wine at the Post Exchange in camp, the first place he generally strikes for when on pass is the nearest saloon, where in Porto Rico he is served with rum loaded with fusil oil—at home, vile doctored whiskey—in the Philippines,—vino—a sort of wood alcohol, distilled from the nepa leaf—or in China, the samshu, a product of rice,—all rank poisons, one or two drinks of which “steals away his brains”. Then follows excesses to which in his sober moments he would be the last to descend, insubordination, drunkenness, debauchery, or desertion.

The record of the summary Court of the 12th U. S. Infantry shows that during February and March, 1900, at Paniqui, P. I. there were between 70 and 90 trials by Court Martial for each month. Four-fifths of the offenses were “intoxication from native vino.” A Post Exchange was established in the latter part of March. Since then and until February 1901, there were never more than twenty trials in any month, and one month the number was reduced to eight. The Record shows no more than two cases of “vino intoxication” in any month. The Company Commander’s report shows there are but eight total abstainers in the Regiment.

In reviewing the report of vital statistics at Camp Reilly, you must have observed the high per centage of the venereal diseases, over 50 per cent. of all patients under treatment being for this cause. It is to this distressing factor, in connection with the subject of the Canteen, that your attention is specially invited. Venereal disease always claims a large proportion of patients in a Military hospital, but I have it on the

authority of Lieut. Greenleaf and his assistant Dr. Lewis, than whom I have met no more conscientious officers in the Medical Department of the American Army, that, since the abolition of the Canteen, the percentage of these cases has almost doubled. My own observations in other Military Hospitals tend to a similar conclusion. The men get their liquor away from the Post, and leave the rum hole for the brothel. When the canteen was maintained they drank less, were under better influences, and returned, sober and contented, to their library and reading room, or their other quarters. When the misguided enthusiasts of the W. C. T. U. stop to reflect that the result of their influence in inducing Congress to abolish the Post Exchange, has produced this enormous increase of wretchedness in the Army Hospitals, and made many a husband, father or lover the victim of a degrading disease, they may indulge in less self-congratulation, and conclude to cease interfering with institutions about which they are so hopelessly ignorant. The Post Exchange was the most rational compromise that the ripe experience of the ablest officers of the Army could devise,—it was not abused in the camps; it has been the soldier's friend, often saving him from disgrace and disease worse than death. Some years ago the "Exeter Hall crowd" of England, induced Parliament, by methods similar to those used by the W. C. T. U., to abolish the "Contagious Diseases Act" in India, a law that had proved so effective in the elimination of these diseases, that in 1884 they were comparatively unknown in the Army there. Today, owing to its abolition, there is no single cause so prolific in invaliding men home as this one. The Rains Law, another instance of meddlesome legislation, has been productive in spreading immorality to an extent heretofore unheard of in the greatest metropolis of this country, but there is no necessity of elaborating the subject to a medical audience. If the W. C. T. U. could be induced to direct its energies toward a cooperation with the medical associations of our country, which are now making a study of the social evil, and are endeavoring to bring about its segregation and limitation as far as possible within prop-

er lines, it would *then* accomplish a great reform, and prove itself a *real* benefactor to humanity.

Congress, however, when considering the repeal of the Anti-Canteen Act, as it must at its next session, will do well to remember that the abolition of the Post Exchange has not promoted temperance. On the contrary, it has decidedly promoted intemperance, insubordination, discontent, sullenness, disease and desertion. It has embittered the men, and driven them to the very excesses sought to be abolished. You cannot legislate men to be virtuous or to be total abstainers, but you can, by judicious handling, promote chastity and temperance. The Canteen fostered moderation. It led the hard drinker to less indulgence and removed the temptation which always clings to forbidden fruit. Its abolition angered the men. They felt it as an insult to their manhood, and a deprivation of their natural rights. They *will* drink if they wish, and they resent the attempt to prevent them. A glass or two of beer is not injurious to them, and they know it, and sneeringly criticise Congressmen—paid servants of the Government—who retain their well patronized cloak room with its private stock of good old whiskey, but who rob the soldiers—other paid servants of the same Government—of their right to take a glass of beer on their camp grounds, in their well-disciplined and orderly Canteens. And who will gainsay the justice of this conclusion?

DISCUSSION.

MAJOR LOUIS L. SEAMAN, U. S. V. E.—To bring this matter to a head, I present the following resolution:

WHEREAS, The Association of Military Surgeons of the United States, now in session at St. Paul, recognizes that the abolition of the Army Post Exchange or Canteen has resulted, and must inevitably result, in an increase of intemperance, insubordination, discontent, desertion and disease in the Army, Therefore, be it

RESOLVED, That this body deplores the action of Congress in abolishing the said Post Exchange or Canteen, and, in the interests of sanitation, morality and discipline, recommends its re-establishment at the earliest possible date.¹

¹ For further discussion upon this resolution, and additional sections, see page 54.

COL. W. W. GRANT, Colo.—I hope everybody will discuss this paper. I do not think this Association should adjourn without passing a resolution asking congress to repeal its recent act abolishing the canteen. I was in conversation recently with Gen. Lee of Denver, who as a medical man and an army officer has had a wide experience, and he denounced this act in unmeasured terms and said Congress would have to repeal it. He is in a position to speak authoritatively in reference to this matter. Of course the influence that operated upon it we all understand. Congressmen do not expect to receive as much support from medical men as they do from others. If medical men would agitate this matter, if they were determined and united in their demands on their congressmen they could accomplish for themselves and the welfare of the country and the sanitary conditions of the army much more than they have yet accomplished.

COL. R. H. REED, Wyo.—This paper is the most admirable I have ever heard upon this subject. It brings up a question of vital importance to our soldiers and one that this body should discuss freely and thoroughly. It is unfortunate that we have a class of people in this country who are theorists. The class represented by the W. C. T. U. are doing a good work in their sphere, but they have no business to meddle with things that do not belong to them; they have gotten out of their sphere, and have meddled in the laws of the United States in doing so. During the past session of congress they have induced the members to pass this law, which, instead of accomplishing what they desired, has accomplished the very opposite. It is very evident that this body will have to act, if it desires to accomplish the repeal of this law, and for that reason I am heartily in favor of the resolution offered. I hope we will not only pass the resolution, but I hope a copy of the resolution and paper will be sent to every congressman and senator.

BRIG. GEN F. W. BYERS, Wis.—I am interested probably no more and no less than any other citizen of the United States or old soldier in this canteen question. I have seen something of it in the volunteer service, and being connected with the post tradership years ago I think and believe the greatest mistake that has been made in late years has been this cursed meddling with the army by outsiders not connected with it. Under the old method of conducting the canteen or post exchange as it is called now, the soldier took control, and it was within the province of every post to say what should or should not be sold; the post controlled this matter. I need not go on

at length to speak about the matter, but there has been a mistake about it. The good women meant to do some good, but they went after it in the wrong way, and I think however much a congressman may want to do his duty he usually counts the votes behind every measure that comes up. Now if we can give those people at Washington to understand that this Association of Military Surgeons controls more votes than the W. C. T. U. we can do something, (applause) otherwise the matter will stay where it is. I do not like politics in the army, I do not like politics in anything military, but there is politics in this, and we have got to give the authorities at Washington to understand that we have votes behind us as well as the W. C. T. U. (Applause).

COL. W. W. GRANT, Colo.—I would just like a word or two to finish my remarks. I do not think it is worth while to say that women should not take an interest in this matter. They have the welfare of the army and the best citizenship at heart. I think the underlying principles of the W. C. T. U. are based on the very best motives, and if we can convince them—
[GEN. BYERS: You can't do it; I live with one of them.]
[Laughter.] I do believe if that organization is approached properly, and there is no organization in the country that public men and women respect more, they can be convinced that a mistake has been made; and by united action we can show public men and public officials that we have influence.

There is another matter worthy of our consideration, and that is the change in diet. Who is responsible for the fact that the diet is not changed to suit the soldier in a tropical or temperate climate? Is it the surgeon general or congress? Are the public officials who have direct charge of this matter or the commissary general the better informed? There is a medical responsibility in this matter, and if medical men in authority, as in our positions we are, would impress their information in this respect on public men and bodies, we could effect a change in the diet which now means sickness and unfit the men in every way for the duties of a soldier. This is true in reference to the canteen. The canteen can be abused; too much alcohol in such a climate it is well known is an evil, and yet total abstinence under certain conditions and circumstances is a greater evil. The moderate use of alcohol by the soldier is known to be a good thing, and we should use our influence for whatever may benefit and tend to the welfare of the people in whom we are especially interested.

LIEUT. COL. J. D. GRIFFITH, Mo.—Let me say as I have said before, had it not been for the canteen no one knows how many

typhoid cases we would have had at Chickamauga. Of the 38,000 troops gathered there, and I think Col. Hoff will substantiate the statement, eleven and one-half per cent had typhoid fever, and the canteen helped us in fully seven per cent. We only lost a very small percentage, less than they do in any city in the union, but the canteen helped us out. The soldier could get his beer; you did not find him drunk. It was very rarely we had a court martial. Let me say right here that the resolutions of Major Seaman are right to the point, and if this Association can only convince congress that it has taken a wrong step in that direction it means everything to our army. Not only to the regular army, but to the volunteer, and let me say right here that the volunteer in the United States today is the bulwark of the government. The United States army may number 100,000 men, and if it is necessary it can be increased by volunteer service to ten millions in sixty days. When this thing comes to a test, let me say, Mr. President, the canteen will come again. It is our duty to bring it forward and we must have it. It is a necessity; it may be a necessary evil, but we have them all over the land. We must have the canteen.

MAJ. T. C. CLARK, Minn.—I hope the discussion will be very full on this question. Ours is a very small association, it is true, but it ought to be a very influential one, being composed of military men in active service or in state service. Our numbers will not cut so much figure as the judgment we arrive at and in the discussion we send forth, but our discussion should be dignified and our action unanimous to be effective. Now I would be the last person in the world to question the motive of the women of the W. C. T. U. We all know that the instinct of woman is always on the side of right. We may question her logic, we may accuse her of jumping at conclusions, we may question her wisdom as a legislator, but we must always give her credit for having a high motive and a pure instinct in combatting that which she thinks is wrong. Consequently any action we may take here should be dignified, and we should try to make it as effective in that way as possible, and I think the action of this Association, as embodied in this resolution, forwarded to members of congress and spread broadcast throughout the country, cannot fail to have its effect. The opinion of a body of medical men directly interested in this question should appeal to every thinking person, and if there are any members who hold views contrary to this resolution I hope they will speak them, be-

cause to my mind the sentiment of this Association should be unanimous and it ought to go a great way. My experience has been limited, but such as it was I am convinced the canteen was productive of good order and temperance. When men got away from the restraints and influence of the camp to neighboring towns with their low dives intoxication and unbridled license took the place of moderation and sobriety. I do not think there is any question but what that would be the unanimous sentiment of medical officers throughout the army. It only becomes a question of instinct, of demand of the physical nature that is world wide, the demand for a stimulant in some form or other. In some it takes the form of tea or coffee, in others liquor; it manifests itself in various ways. It must be met in a spirit of fairness, in a spirit which will control and regulate and restrict, but it is not effected by a law on the statute book which is ignored, the consequences of which will produce the result you are trying to avo'd. I hope the question will be fully discussed by every member who has the subject at heart and that the conclusions we may arrive at will be unanimous.

MAJ. GEO. HALLEY, Mo.—I think the great mistake that has been made has been the advocacy of total abstinence by legislation; that stand has been a mistaken one, and it is a mistake not with reference to the temperance question alone, but with reference to a very large amount of effort that is made to place on the statute books laws to make morals. They may be all right enough, I have no reason to doubt the wisdom of some of them, but in this particular question dealing with temperance it is unwise, it is fatal, it is absolutely impossible to stop men drinking. They have got into that habit and the best that can be done is to regulate it. That is the recognized principle I think in our sociological relations, and in dealing with this question by congress it would be unwise to impugn the motives of the noble band of women who have been trying and are still trying to improve the morals of the army. Their motives have unquestionably been good, but their methods have been unwise, and I have no doubt but that if we can lay this matter properly before congress—and I would like to have this resolution that Major Seaman read, with a short, concise synopsis of the results of the abolishment of the canteen placed alongside of it, placed in the hands of every congressman that he may read it,—and as I said before, if this matter is properly placed before congress I have little doubt of a favorable result. Perhaps some of you know more about this

than I do, but a large bulk of such matters goes into a congressman's waste basket, but I want to put it in such a way that he will read and recognize the importance of this resolution, and we will get a careful consideration of the question by congress and a repeal of a most obnoxious law which causes a very serious interference with the usefulness of the army. I therefore would ask that Major Seaman embody a short synoptical resume of that portion of his paper in which he tells of the evils following the abolishment of the canteen to be submitted to congress with the resolution. The paper I think is one of the most important we can stop to discuss, because it goes to the very heart of army organization.

MAJ. ALLEN A. WESLEY, Ill.—I desire to state that the opinion of the medical officers of the United States Army is unanimous on this question, that is, if the press reports of Chicago are correct. Major Charles E. Woodruff of the regular service, according to the Chicago press, has stated that all kinds of intoxicating liquors should be allowed in the tropics. This positive statement, elaborated in the press is somewhat responsible I think for the action that the ladies took in Chicago, for the papers elaborated very much and the people talked about it a good deal. I think we ought not only to lay a memorial before congress, but we ought to lay a memorial before each one of our editors as well and get them to talk about the matter and teach the public what we want. The press is the educator of the people, and if the press goes right and says that this Association demands the repeal of this law congress will take notice of it. I think, as has been stated, that we can also enlist on our side the W. C. T. U., and we can do that through the press and individually. I believe the canteen is a very potent factor—as stated by Major Seaman, and as I stated last year before the convention—in keeping the soldier in the camp and in keeping up the *morale* of the camp; in that respect I think it is the most potent factor we have, because if the soldier is in camp he is out of mischief elsewhere and he is under observation by the officer. I think we must all heartily concur in what has been said by Major Seaman in his most admirable paper.

There is one question I would like to ask, and that is with reference to salt. Nothing was said about that in his paper. Sugar, of course, is a very desirable food generally, but is there nothing to be gotten from salt? Is there any difference in the tropical and arctic regions in the use of salt? Is its relation to the soldier as a stimulant or vital agent any differ-

ent? I would like to ask whether Major Seaman can give any information in reference to that.

COL. R. H. REED, Wyo.—I just want to add one word to what has been said in reference to our congressmen. The suggestion made by my friend from Missouri [Major Halley] would not be of much value in this case. Send a paper of this kind to the average congressman and it goes into his waste basket. That is not the plan provided for placing the resolution before them. The idea is to have this paper published and each one of us to reach our own congressman in our own state. In addition to that we should have a committee appointed, the members of which live near Washington, and can easily come in touch with congress, to act in this matter and then with the concerted action by members of this Association in approaching their individual members of congress and senators on the committee which will discuss this matter, it can be prevented from being laid on the shelf, but favorably reported for passage. If this is done I have no doubt of the ultimate result. I would recommend that action of this kind be taken, and that we make a systematic effort to attain the point desired with the least possible encumbrance to the members of the house and senate.

LIEUT. COL. JOHN VAN R. HOFF, U. S. A.—I quite appreciate the unusual interest this Association takes in the post exchange which we of the regular establishment believe in. At the same time while listening to this discussion I was impressed with the idea that there are one or two points which we have not considered. Perhaps it would be well to look into the cause of the agitation to get rid of the post exchange. How was it brought about? For eight years the post exchange existed without any protest from any one. We in the service recognized its value each year as our experience increased. We knew it was an experiment in the service, but we tried it and proved it and we were contented with the situation until something happened to change all this and interest the women of the country in the moral welfare of the army. What happened? In 1898 war broke out. The army was suddenly expanded from 25,000 to 250,000, and a considerable proportion of the young men of the country entered the service anxious to support the honor of the flag, anxious to do their duty as soldiers, anxious to have the experience that all young men seek. These 250,000 men, raw volunteers, were gathered in camp. The material was there, the foundation was there, the experience was not. Among other things that these regiments organized, and which they or-

ganized on exactly the same principle as they organized themselves,—in the very best way they knew how,—was the regimental post exchange or canteen. I well remember when this was done. I remember the fact that the regulations governing the post exchange under the regular establishment were not a part of the "Blue Book" so called,—the general Regulations of the army, which most of us have in the field,—and the consequence was when these exchanges were organized they were not organized under the rule laid down in the regular establishment except in a general way. How could it be expected to be otherwise? I am not offering this in criticism, but simply in an effort to trace out the peculiar causes of the action of the women of the country against this institution. Many irregularities crept into these exchanges. Much was done that never was intended to be done in the regular establishment.

I heard a conversation between two gentlemen, officers who belonged to a volunteer regiment, who were discussing the post exchange.

"How did you get on last month?"

"We took in \$2000."

"How did you get that much?"

"We had a regiment next to ours whose colonel would not let his men have a post exchange and we just filled them up with beer."

"Where did you get it?"

"We made an arrangement with a man down here and he knocked off fifty per cent. on the price."

"What did you do with the money?"

"I got it all."

"Did you spend any on the mess?"

"What do I want to spend any on the mess for? I don't know much about that. I will speak of that by and by."

Such things occurred during that time through ignorance, not through deliberate intent, but there occurred things that were altogether irregular and which produce a wrong impression upon the 250,000 men in the army, and they went back to their mothers, their wives and their sisters and told them of the things that were going on, and they took it up because they thought it was wrong. That is the reason why the W. C. T. U. took up this agitation; that is the reason they went to congress, and congress was absolutely unable to say no, although congress for the most part was thoroughly convinced that the women were wrong. They could not resist the

influence and the methods behind the W. C. T. U. If I am right in my conclusion it is the Woman's Christian Temperance Union we must convince before we can get them to rescind their action. I believe they can be convinced, not this year, and possibly not next year, but after a sufficient length of time they will realize that they misunderstood the situation, and I believe we can get results through them that perhaps we cannot get through congress. There is no question but that the post exchange has its value. Its value is apparent to us; we know what it means; we know how good it is for our soldiers; we know how they promised temperance,—and I distinguish between temperance and teetotalism. We all know that the soldier is just the same as the citizen except that he wears a uniform. He has the same tastes, the same inclination, the same pulse under the blue as he has in the performance of his daily vocations as a citizen. The only point I have to make, Mr. Chairman, is this: not only must we labor with congress, but we must labor with the Woman's Christian Temperance Union, and right away if we expect to get any results in this matter.

BRIG. GEN. GEO. COOK, N. H.—Something has been said here about combined effort. You that are members of the American Medical Association may recall that they have a committee on national legislation. They have accomplished a good deal of work in that direction and that committee is still in existence. They will have a meeting during the session of the American Medical Association and also at Washington next winter. Among other matters this question of the canteen may come up in reference to the medical department of the army and navy. I want to call your attention to the fact that we ought to work together through the great national organization so we may be strong and have a good influence back of us. I am in favor of the resolution as submitted by Maj. Seaman, and I am also in favor of sending it to every congressman and to every association of the W. C. T. U., whom I believe we should deal with kindly and generously and not call anything they have done by a harder term than to say they were misguided; then we can accomplish something.

I would like to add one word in reply to the remarks of the gentleman from Illinois in quoting Major Woodruff's statement as elaborated by the Chicago press and the Chicago temperance associations. Major Woodruff said in his article on the subject of "Food in the Tropics," that he believed it quite necessary that a certain amount of alcohol should be

used; that it was the universal custom of people in tropical countries to use alcohol; that apparently alcohol was necessary; that apparently also it had no deleterious effects, and that therefore he thought they were justified in its use. Undoubtedly some of the Chicago papers manipulated the statement to forward their own sensational ends, but Major Woodruff's conclusions are certainly justified by experience. I only speak of this with a view to Major Woodruff's position being made clear in the notes of the discussion.



THREE NOTEWORTHY CASES OF BRAIN INJURY.

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FROM the earliest dawn of medical science injuries of the brain, the seat of life and of intellect, if not the soul, have furnished an interesting field for study. The correct explanation of concussion; the mechanism by which laceration and hemorrhage take place without fracture; the laws which govern the direction of the lines of fracture; the prognosis as to life and health and intellect; and the best methods of treatment—are problems which have attracted the attention of surgeons and physicians from the days of Hippocrates and are still burning questions for consideration by the surgeons of our day.

The dangers in cerebral injuries are : shock, hemorrhage causing compression or anaemia, and infection.

The symptoms of shock occur immediately; those of hemorrhage at the same time or a few hours later, occasionally as much as a week later; and those of infection from two days to a week or even several months or years after an injury, possibly as a result of a second injury which arouses a focus of infection which has long remained dormant.

Shock so often coexists with hemorrhage that in many cases it is impossible to know just how much of the symptoms to attribute to shock and how much to hemorrhage.

The remote effects are : abscess, tumor, epilepsy, insanity, and chronic headache.

The work of a brilliant galaxy of neurologists and surgeons composed of Ferrier, Broca, von Bergmann, Starr, Keen, Victor Horsley, and others, in cerebral localization and operations on the brain, during the last quarter of the century just ended, has established surgery of the brain on a firm basis and has proved that with the exercise of proper judgment, skill, and antiseptic precaution, this dangerous region can be invaded with almost the same impunity as that which follows operations on the abdominal viscera—an impunity that is so nearly the rule that the abdominal cavity has been termed the "playground of the surgeon."

The large amount of brain tissue which can be destroyed without producing death, and the toleration of the brain of the presence of foreign bodies, are remarkable. Two examples of the latter, selected from many reported cases may be mentioned: Evans reports a case in which a piece of wood one and a quarter inch long and the third of an inch thick, remained in a man's brain, just above the ethmoid bone, for thirty-two years. Forwood reports the case of a soldier who was in good health five months after having been shot in the forehead, the Mauser bullet, as shown by a radiograph, remaining lodged in the posterior part of the brain about the tentorium cerebelli.

According to my experience the greatest mortality occurs in injuries which are caused by falls from a height, striking on the head, such as being thrown by a horse, falling from a building or scaffold or a rapidly moving car, or taking a "header" from a bicycle. Such cases are usually accompanied by extensive fracture of the skull, involving both the base and vertex, with numerous lacerations and hemorrhage in the substance of the brain. Of almost equal fatality are gunshot wounds of the brain; while the injuries resulting from blows upon the head by clubs, hammers, hatchets and stones give the smallest mortality, such cases usually consisting in a limited fracture of the skull with a corresponding lesion in the brain.

The treatment will naturally depend upon the nature of

the injury. Symptoms of compression from hemorrhage, depressed bone or other foreign body, demand operative interference. Gunshot wounds of the brain, unfortunately, in the majority of cases are not benefitted by operation. In the few cases in which the patient survives the shock and the ball can be located by means of the Roentgen Ray in an accessible locality, it should be removed in order to prevent the development of abscess, cyst, tumor, or other dangerous sequel.

The following three cases have been selected from my note-book as worthy of being reported:

CASE 1. Severe hemorrhage with laceration of the brain, without fracture of the skull or rupture of the dura mater.

K. M., aged 18 years; white; native of the United States, was admitted to the Emergency Hospital August 10, 1899, having just been struck on the head with a club and knocked down. On being assisted to his feet he walked a short distance, fell again and lapsed into complete unconsciousness.

Examination one hour after the injury. Patient profoundly unconscious; breathing deep, sometimes sighing; both pupils dilated and immobile, the pulse 60 and full; clonic contraction at short intervals of the right arm and leg and sometimes the left arm, with persistent tendency of the face to turn to the left side. A small contused wound of the scalp, not extending to the bone, was observed just above the left ear.

A diagnosis of cerebral hemorrhage was made and the patient was immediately prepared for operation. No anaesthetic was necessary. A large flap of scalp was turned down on the left side of the head but a careful examination failed to detect any fracture of the skull. By means of a trephine and bone forceps a section of the skull 10 centimetres in diameter was removed over the fissure of Rolando, when the dura mater was disclosed, bulging, tense, without pulsation, laceration, or rupture. On incising the dura a large black clot of blood, about the size of an orange, popped out. A freely bleeding artery on the surface of the brain was ligated and the finger was gently passed around the opening beneath the dura, but no further clots were discovered. There was no pulsation in the portion of brain exposed. A grooved dilator was passed into the left lateral ventricle, but nothing was discovered.

The only changes caused by the operation were contraction of the pupils and a diminution in the frequency of the

convulsions, and the patient died about two hours later without becoming conscious. The necropsy revealed numerous small hemorrhages throughout both hemispheres.

This case affords an excellent clinical illustration of the elasticity of the skull in permitting such an extensive injury to the brain without fracture of the skull or rupture to the dura mater, as shown by Felizet's well known experiment of filling the skull with paraffine, then dropping it on the floor from a height when it was found that the paraffine is flattened or indented at the point of impact without fracture of the skull.

CASE 2. Compound fracture of the frontal, nasal, and ethmoid bones, with depression of almost the entire frontal bone.

E. M., aged 20 years; native of the United States; white; female; typewriter; was admitted to the Emergency Hospital July 21, 1899.

History.—The patient had been injured in a collision between two "roller coasters," by being struck in the face by some object the nature of which was not certainly known, but it was thought to have been the back of another person's head. Unconsciousness resulted but only lasted for a short time, and on admission to the hospital the patient was perfectly conscious, the nose was bleeding freely and she occasionally vomited black blood, which she had probably swallowed. Both eyes were closed by the swelling. The upper part of the nose and almost the entire frontal bone were depressed to the depth of from one to two centimetres.

The patient was prepared for operation by shaving and disinfecting the scalp and the operation was performed about three hours after the injury. An incision was made from one temple to the other, across the top of the head through the edge of the hair, just behind or above the line of depression, and the anterior flap reflected forward. The line of fracture was then seen to extend from the nasal bones through the left supra-orbital ridge, upward and outward and then across through the frontal bone about $2\frac{1}{2}$ centimetres anterior to the coronal suture to the opposite side of the head; then downward and forward to the right temporal fossa just behind the external angular process of the frontal bone. Two other lines of fracture extended from the principal one, one on either side in a direction backward through the remainder of the frontal, and into the parietal bones, to an unknown distance. The parietal bones were freely moveable but were not displaced. That

portion of the frontal bone included in the line of fracture was depressed and overlapped by the surrounding bone, the depression being most marked at the superior border. The depressed bone was elevated by means of a lever passed down to the nasal eminence between the skull and dura mater, the edges of the fractured bones were carefully adjusted, the scalp united with silkworm gut sutures, without drainage, and a dressing applied. The first dressing was made on the 10th day after the operation, when primary union was found to have taken place and the stitches were removed. There was some bleeding from the posterior nares for the first three or four days, but the patient recovered without incident and left the hospital at the end of two weeks.

At this time, one year and ten months after the injury, the patient's condition is as follows:

She is able to attend to her work but has occasional spells, once in two or three months, of a highly nervous character, with mental depression, excitability, headache and insomnia, lasting from two or three days to a week,—possibly the premonitory symptoms of epilepsy or insanity. The physical deformity is not very great; the nose is somewhat broadened at the root and the left frontal eminence is a little less prominent than the right; there is a slight internal squint of the left eye and the patient has lost the sense of smell,—evidently from injury to the olfactory nerves from fracture of the ethmoid bone, or inflammatory thickening of the dura mater. A remarkable feature of this case was the extensive fracture of the skull, including both the base and vault but especially the latter, with comparatively little damage to the brain.

CASE 3. Compound fracture of the skull with loss of brain tissue.—Recovery.

E. H., Negro, aged 38 years; native of Virginia, laborer; was admitted to the Emergency Hospital February 6, 1901.

History.—The patient had just been struck on the head by a portion of a rapidly revolving wheel which had broken. He was not unconscious but in a dazed condition and apparently unable to talk or understand what was said to him. He had lost considerable blood and was suffering from shock, so 500 cc of normal salt solution were injected into the left median basilic vein. A wound involving scalp, skull and brain extended 15 centimetres from a point $2\frac{1}{2}$ centimetres above and the same distance in front of the right ear, backward and upward to a point 11 centimetres above the external occipital protuberance. Blood clots and brain tissue protruded along the entire

wound. There was conjugate deviation of the eyes towards the side of the injury and partial paralysis of the left side of the face and the left upper and lower extremities.

After shaving and disinfecting the head, the operation was begun, without an anaesthetic but as the patient was restless, turning his head from side to side, chloroform was given. The blood clots and brain tissue projecting and seven fragments of bone buried in the brain, were removed and a branch of the middle meningeal artery ligated. The opening in the skull was shaped like a dumb-bell, the anterior extremity about 4 centimetres in diameter, being the larger. The dura mater was so much lacerated as to render the use of sutures impossible and as the brain continued to project through the skull it was kept in place by packing over two square metres of gauze into the cavity of the skull. The scalp was then united by sutures, leaving three openings through which the ends of the gauze projected, so that it could be removed at the proper time.

February 7th, the patient was doing fairly well but decidedly apathetic and indifferent to his surroundings. Right conjugate deviation of the eyes still marked. No evidence of pain on pricking the left arm and leg and only slight on pricking the face. He was able to move the left arm and leg, but rather weakly, the arm being weaker than the leg.

February 9th, the gauze packing is renewed. A rough test shows the existence of left homonymous hemianopsia.

February 18th, the conjugate deviation has about disappeared, the patient being able to turn his eyes in any direction. His mind is clear but he seems to cerebrate slowly. Fungus cerebri occurred in each of the openings left for removing gauze, and was controlled by packing as in the beginning, changing the dressing once in two or three days.

February 27th, three weeks after the injury, the patient was permitted to get up. He was able to walk by holding to objects and dragging the left leg. He complains of a sensation of pins and needles in the left arm and leg.

March 9th, thirty-one days after the injury, the fungus cerebri has all disappeared and the surface of the brain has sunk to a distance of at least $2\frac{1}{2}$ centimetres below the surface of the skull. The left arm and leg are much stronger and the patient is able to walk about without holding to objects. The eyes were examined by Dr. Swann Burnett who confirmed the diagnosis of left homonymous hemianopsia. The test for Wernicke's symptom was not made.

When last examined, April 27th, the wounds are entirely

healed and the patient walks without limping. The left hand is almost as strong as the right but he has difficulty in approximating the thumb to the tips of the fingers so that fine movements such as buttoning his clothing, or writing with a pen, are impossible. This is not from want of strength but from absence or dullness of the tactile sense, as he can approximate them by an effort while looking at them, but is unable to do so unless he sees them. The mouth is drawn slightly to the right side. Left homonymous hemianopsia is still well marked and there is also partial deafness of the left ear. The sense of smell seems to be normal.

In this case the patient lost at least two ounces of brain. As mapped out on the skull the wound in the brain must have extended from a point just below the division of the fissure of Sylvius into its two branches, backward and upward, crossing the lower extremity of the fissure of Rolando and gradually diverging from it posteriorly as it approached the median line of the skull, involving the first temporo-sphenoidal convolution, which would account for the partial deafness; the supramarginal and angular convolutions and, possibly, the cuneus, hence the homonymous hemianopsia.

The conjugate deviation of the eyes is not easily explained if it is assumed that this phenomenon depends on injury to the second frontal convolution, as the wound was situated some distance behind and below this convolution. The third frontal convolution might have been involved in the lesion, so it seems fair in this case to attribute the conjugate deviation to injury of this convolution.

The loss of tactile sensation in the left hand, and to a less degree in the foot, was to be expected, from injury to the posterior motor area. According to Starr, "the parts susceptible of the finest and most delicate movements, those directed by the most acute sensations—the lips, the fingers and the toes—lie furthest back in the motor area, chiefly in the posterior central convolution. Lesions in this convolution almost always cause some loss of tactile sensation as well as paralysis."

As the patient was right-handed and the injury on the right side, there were no symptoms of aphasia, no interference

with memory of any kind, as there would undoubtedly have been, had the same lesion occurred on the left side.

DISCUSSION.

LIEUT. COL. J. D. GRIFFITH, Mo.—May I just raise a question? Although I am a firm believer in it, and as there are probably some very acute neurologists here who can probably answer it,—why is it that Maj. Vaughan is so pronounced in his statement that had the injury been on the left side there would have been a complete amnesic aphasia with an inability to pronounce and articulate? Why would it not be the case if on the right side? I appreciate most heartily the paper, but I want to hear from some of these neurologists, why the same is not true of the right side as well as the left.

COL. W. W. GRANT, Colo.—There is a very practical question connected with these brain injuries as to the matter of trephining. What rule should govern the surgeon in those cases of depression, or where those persistent symptoms of depression exist, as to trephining in the absence of fracture or depression or pressure of the skull? As I understand it, to this day there is no uniform rule in this respect. I remember a railroad case a great many years ago where a man was injured and rendered unconscious and remained so for five days, although no visible depression of the skull existed, and without being permitted an examination of the injury myself to ascertain whether there was a fracture, I earnestly advised the railway surgeon to trephine, because it seemed to me there must be hemorrhage producing this compression; but I found in examining the subject that if a sufficient time is permitted to elapse many of the cases show an absence of depressed skull where the surgeon would otherwise deem himself justified in operating. I would like to know some definite rule that we can adopt in these cases. Even with slight depression it is not the rule to raise the skull if there are no symptoms of compression, and this is of the highest practical importance. I believe, in persistent symptoms of compression trephining should be used for exploratory purposes and for no other.

MAJOR GEO. HALLEY, Mo.—I have opened the skull a great many times and have had some experience along this line. It is true that quite a large number of injuries to the brain occur without fracture or depression, as related in the paper, with interstitial hemorrhage. Those cases I think are exceptional, not the rule. I think the skull can be opened

with relative immunity if it is done under ordinary aseptic precautions. I have been in the habit of teaching students in the cases of interference the necessity of the thorough removal of all the hair from the scalp and the thorough cleansing of the scalp as would be necessary were it on any other part of the body. I think this is very frequently neglected, but if the scalp is thoroughly cleaned the operation can safely be proceeded with. If practical precautions were taken, such as I have been in the habit of taking, I think the operation of opening the skull and making an exploration is exceedingly safe.

COL. W. W. GRANT, Colo.—In the history of the case I mentioned his symptoms disappeared entirely on the eighth day; on the thirteenth day he commenced to vomit, his coma returned and he died. What from?

MAJOR GEO. HALLEY, Mo.—I take it in that case there had been an interstitial hemorrhage, it had been rapidly absorbed and vomiting, due to some disturbance of the stomach, probably increased the hemorrhage, establishing a larger clot and he died of intestinal hemorrhage.

COL. W. W. GRANT, Colo.—That would have justified immediate trephining.

I have been in the habit of laying down to students a rule that I have for many years seen no reason to depart from, and that is, in every case of fracture of the skull with depression of the bone, whether it is simple or compound, it ought to be trephined and the bone elevated. Every case of fracture of the bone with depression, no matter whether there are symptoms of compression or not, the skull ought to be opened and the bone elevated because of the disastrous results that follow invariably; and I wish to emphatically state that there invariably ensues from compression of the brain in three, four or five years afterwards Jacksonian epilepsy. This is controverted by many persons who say in numerous cases this rule can be deviated from. In seeing many of these cases I have come more and more personally determined in all cases to operate. Sometimes they go on for as long as five years,—I think rarely beyond that,—and then again they have these sensations in a mild form of epilepsy which result later in a more aggravated form. Wherever there is fracture of the bone with depression and it is compound, everybody concedes the necessity of operation, of opening the skull. You have got a compound fracture and you cannot make it any worse. In all cases of brain injury a very thorough exploration should be made. A case came to me not very long ago in which the

surgeon had explored the wound but without opening it, and then washed it out and dressed the wound, but the symptoms persisted and he sent the case to me for examination. I opened the wound and found a large piece of bone adhering with the hair to the brain. In those cases it is not only necessary to open the wound, but to make a large incision in the scalp and through the bone, remove a large area and then explore the brain pulp so as to get a thorough cleaning out of the wound. It is just what you would do in the tissues elsewhere and you do little harm to the brain in your examination and taking out the broken down tissue. You are not going to make it any worse at any rate. In case there is a fracture of the bone and no depression, it becomes a question of what to do. The rule that has guided me is that wherever there are symptoms of cerebral hemorrhage among the different convolutions there is a hemorrhage that requires evacuation. They are, I take it, the most severe injuries the brain can be subjected to. They have not the manifestation of locality to guide you but where the effusion is general it is from compression of the parietes. You are not going to make it any worse to open the skull. In those cases where there is a limited area of compression you can locate very accurately the place of the hemorrhage. Where it has occurred over a large area you should immediately trephine. No matter where the injury appears to be, it is an invariable guide. You can open up the skull with absolute impunity and you can do your operation with absolute asepsis.

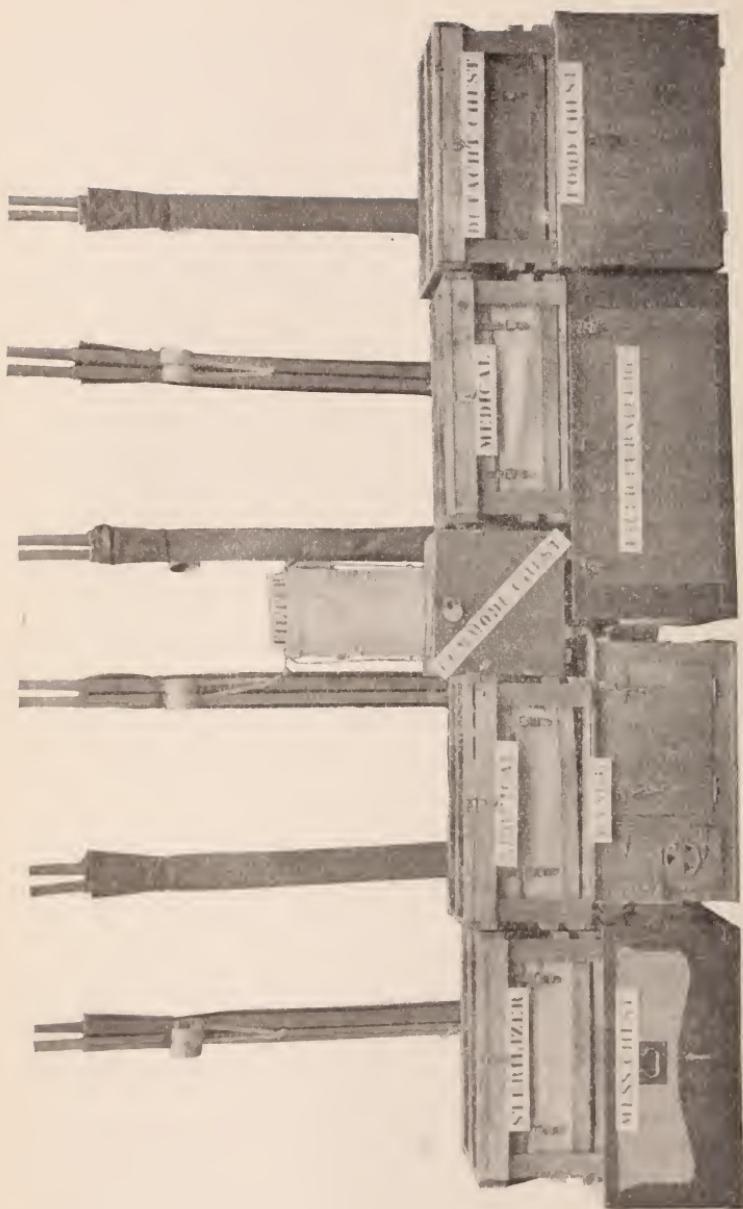
COL. R. H. REED, Wyo.—The question that is brought up by Col. Grant can partly be answered by citing a case that occurred in my practice some years ago, and it may throw a little light on the question of indiscriminate trephining. A few years ago one of our members read a paper in which he stated there was no more danger in trephining the skull than there was in opening an abscess, and I thought at the time it was a pretty strong proposition, but yet I do not know but what it is true. I was called to a case some miles south of Columbus, Ohio, where a man was paralyzed. I found the paralysis on the right side, both arm and leg. There was no bone fracture and I knew of nothing that could cause this condition except that he was struck over the head. That was all the information I could get. Upon examination I was satisfied that the brain was involved. I made an examination and found the brain bulging and with no pulsation, and I at once proceeded to a diagnosis which justified me in the belief that there was hemorrhage in the left ventricle. Passing a needle

in the left ventricle I drew out two ounces of bloody serum, and the brain commenced to pulsate. The patient got better, in two days the paralysis had disappeared and he was apparently getting well; the wound healed by first intention. In fourteen days after the operation he suddenly became worse and before I was called he died. The fact was he had been waylaid by three men who jumped on him, stamped him and kicked him, and knowing these circumstances I knew there would be a scrap on hand with the lawyers, so I proceeded to the place at once and took the pathologist of the Ohio University with me. An examination was carefully made and there was found to be interstitial hemorrhage throughout the entire cerebral mass; there was hemorrhage everywhere and the man died from that cause. Notwithstanding all the care we had taken, notwithstanding it was proven that these men had waylaid him for the purpose and with the intent of killing him, yet the lawyers claimed that the doctor killed him; the doctor put a long needle down into his brain and that was the cause of death. Now this case Col. Grant spoke of was probably a case of interstitial hemorrhage.

It is not always best to trephine when we get a chance, but at the same time I believe it is all right when we have unmistakeable symptoms, but I believe there are many instances where the brain is abused with no results at all. I remember a case of a man who fell into a buzz saw and had his head split open. We held a consultation as to whether we should trephine, the majority overruled us and we did not trephine and the man did not die. In a few years it was observed he was getting as red as a boiled lobster. I took him before the Miami County Medical Society to exhibit. He was as red as a boiled lobster from head to foot, but that man lived for thirteen years after that injury. He finally died of pneumonia or some similar medical affection. I was determined to have a postmortem, and I remember distinctly I drove through mud twelve inches deep to get the autopsy. I took two other surgeons with me and we found the skull much larger than ordinary, and when I went to saw the skull I found it was too soft and I took my jack knife and reamed it around; there we found the tract drawn in some two inches long that had become attached to the inner surface of the skull and penetrated to the inner brain substance and carried the injury to the vaso motor system, causing the intense redness. I speak of this to show how desperately the brain may be injured and the person still live, and how very lightly it may be injured and it will cause death.

SURG. GEO. TULLY VAUGHAN, U. S. M. H. S. (*Closing the discussion*)—I just want to make a few remarks in reply to what Col. Griffith said. They simply tend to prove the theory that has been sustained in so many cases that injuries to the left side of the brain have produced aphasia. There was no evidence of aphasia in this case, no interference with the tongue that might not happen in an injury on either side of the brain. In this case the man's memory, as soon as he began to show any at all, was all right; he remembered anything that had taken place; he could write, read and talk as well as he ever could. That would confirm all theories I know of in regard to aphasia being due to injury on the left side. This was on the right side, so the man had no aphasia, he was a right handed man.

I think I can add something to elucidate Col. Grant's problem. I had a patient a good many years ago who was knocked down with a shovel. He was unconscious for some time. He was admitted to the hospital, I examined him carefully and could find no fracture, only a little contusion, but I decided to keep him in the hospital. At the end of seven days he became unconscious and before doing so he had a convulsion. He was not comatose, he was unconscious for probably a half hour after the injury, when he came to and seemed to be all right until the seventh day when he became unconscious with this convulsion. I opened the side of the head corresponding with the injury on the head and when I exposed the skull I found a linear fracture. I found no displacement, but I found a clot on the outside of the dura mater, this was removed and the man recovered. There are quite a number of cases of this kind. I have seen a number of cases of fatal hemorrhage without any fracture of the skull. One case I had was that of a man who staid at the police station all night. He was brought to the hospital next morning and I found him paralyzed on one side. He had a contusion on the other side of the head, but being guided by the symptoms I opened the opposite side of the skull from where the injury occurred and found several blood clots under the dura mater. I explored the lateral sinus in that case. This patient did not improve but died. In this case there was no fracture of the skull. There were hemorrhages in both lobes of the brain; the right lateral ventricle was full of blood, therefore the question comes whether the passing of the exploring needle directly into the hemorrhage was of any good. I have tried it in three operations and never got any good results. If the blood is clotted it cannot run through any trocar. I know of but one case and I do not know that it did any good in that, and that was a case where the surgeon split open the lateral ventricle and removed the clot, but his patient died.



REGIMENTAL MEDICAL FIELD EQUIPMENT, U. S. ARMY.—1901.

REGIMENTAL FIELD EQUIPMENT, MODEL OF 1901,
FOR THE MEDICAL DEPARTMENT OF
THE REGULAR ARMY.

BY MAJOR JOHN VAN RENSSALAER HOFF,

WASHINGTON, D. C.

SURGEON IN THE UNITED STATES ARMY : LIEUTENANT COLONEL
AND CHIEF SURGEON OF UNITED STATES VOLUNTEERS.

I DESIRE to invite the attention of the gentlemen of the Association to the regimental medical equipment of the regular army which is here presented for your consideration; and indeed to the whole question of equipment. This equipment is the present result of our experience, but as there is scarcely a gentleman here who has not had field service during the last three years, I thought it well to submit these chests for examination and discussion, with a view to getting any suggestions the members may have to offer. All who have seen and used these chests have spoken very favorably of them. A regimental outfit,—three months supply,—consists of:

1.—MEDICAL CHEST.
CONTENTS.

(ARTICLES IN ITALICS ARE NOT EXPENDABLE)

Acidum nitricum, bottle in wooden case	Bott.	1, Right Bottom
Acidum sulphuricum aromaticum	Bott.	1, Right Bottom
Aetheris spiritus nitrosi	Bott.	1, Right Bottom
Ammoniae spiritus aromaticus	Bott.	1, Right Bottom
Alcolia burners	No.	6, Right Bottom
Amyl nitris, pearls	Box	1, Drawer
Argenti nitras, cones, in tin	Tin	1, Left Tray
<i>Atomizer. hand</i>	No.	1, Left Tray
<i>Bags, hot water and syringe</i>	No.	2, Left Tray
Bismuthi subgallas	Tin	1, Left Bottom
Bismuthi subnitras	Tin	1, Left Bottom
Blank book	No.	1, Left Tray
<i>Bottles, large,</i>	No.	6,
Boxes, ointment, nests of 3	Nests	8, Right Bottom
<i>Corkscrew</i>	No.	1, Left Tray
Corks, extra for 250 c. c. botts	No.	6, Right Bottom
Corks for vials	No.	48, Right Bottom

<i>Cover for chest.</i>	No.	1,
<i>Crate.</i>	No.	1, (Also used as a stand for chest)
<i>Cups, drinking (nested).</i>	No.	2, Left Tray
<i>Envelopes for tablets</i>	No.	500, In Both Trays.
<i>Emplastrum belladonnae, 4 meter tin.</i>	Tin	1, Right Bottom
<i>Emplastrum cantharidis, 1 meter tin.</i>	Tin	1, Right Bottom
<i>Emplastrum sinapis, 8 meter tin.</i>	Tin	1, Right Bottom
<i>Graduate with leather cover</i>	No.	1, Right Bottom.
<i>Glycerinum</i>	Bott.	1, Right Bottom
<i>Labels for vials.</i>	No.	50, Right Tray
<i>Magnesii sulphas</i>	Tins	2, Left Bottom
<i>Medicine droppers</i>	No.	6, Drawer
<i>Medicine glass in wooden box.</i>	No.	1, Left Tray
<i>Mortar and pestle</i>	No.	1, Left Tray
<i>Oleum terebinthinae</i>	Bott.	1, Right Bottom
<i>Paper, litmus</i>	Book	1, Drawer
<i>Pencils, camel's hair</i>	No.	12, Drawer
<i>Pencils, lead</i>	No.	2, Left Tray
<i>Petrolatum</i>	Tin	1, Left Bottom
<i>Pill-tile</i>	No.	1, Right Bottom
<i>Potassii et sodii tartrat.</i>	Tin	1, Left Bottom
<i>Spatula</i>	No.	1, Left Tray
<i>Stethoscope, double</i>	No.	1, Left Tray
<i>Stomach tubes</i>	No.	2, Left Tray
<i>Syringes, hypodermic with 6 Loddles tablets.</i>	No.	2, Drawer
<i>Syringe, hypodermic needles</i>	No.	6, Left Tray
<i>Syringes, p. glass in wooden cases</i>	No.	1, Left Tray
<i>Syringe, rectal, hard rubber.</i>	Tin	1, Left Tray
<i>Tablets. acidum arsenosum, 1 mgm.</i>	Tin	1, Right Tray
<i>Acidum boricum, 324 mgm.</i>	Tin	1, Right Tray
<i>Acidum tannicum, 324 mgm.</i>	Tin	1, Left Bottom
<i>Ammonii chloridi trochisci</i>	Tin	1, Right Tray
<i>Antipyrinum, 324 mgm.</i>	Tin	1, Left Bottom
<i>Antiseptic</i>	Tin	1, Left Tray
<i>Caffeina citrata, 65 mgm.</i>	Tin	1, Right Tray
<i>Chloral, 324 mgm.</i>	Tin	1, Left Tray
<i>Codeina, 32 mgm.</i>	Tin	1, Left Tray
<i>Colchicum ext. fl. 0.065 c. c.</i>	Tin	1, Left Tray
<i>Cupri arsenis, 0.325 mgm.</i>	Tin	1, Left Tray
<i>Digitalis tinctura, 0.3, c. c.</i>	Tin	1, Left Tray
<i>Glycyrrhizae mistura composita r=4 c. c.</i>	Tin	1, Right Tray
<i>Guaiacolus carbonas, 324 mgm</i>	Tin	1, Left Tray
<i>Hydrargyri chloridum mite, 130 mgm</i>	Tin	1, Right Tray
<i>Hydrargyri iodidum flavum 10 mgm.</i>	Tin	1, Right Tray
<i>Hypodermic. Apomorphinæ hydrochloras.</i>	Bott.	1, Right Tray
<i>6 mgm</i>	Bott.	1, Drawer
<i>Atropinæ sulphas, 0.65 mgm</i>	Bott.	1, Drawer
<i>Cocainæ hydrochloras, 10 mgm.</i>	Bott.	1, Drawer
<i>Digitalinum, 1 mgm</i>	Bott.	1, Drawer
<i>Hyoscinae hydrobromas, 0.65 mgm.</i>	Bott.	1, Drawer
<i>Morphinæ sulphas, 8 mgm</i>	Bott.	1, Drawer
<i>Nitroglycerinum, 0.65 mgm</i>	Bott.	1, Drawer
<i>Strychninae sulphas, 1. mgm</i>	Bott.	1, Drawer
<i>Quininæ hydrochlorosulphas, 65 mgm</i>	Bott.	1, Drawer

One tube of each of the above	
hypodermic tablets excepting	
Quin. hydrochlorosulph.	Tubes 8, Drawer
Ipecacuanhea et opii pulvis, 324 mgm	Tin 1, Left Bottom
Linimentum rubefaciens	Tin 1, Right Tray
Tablets. Oleum tiglii, 0.005 c. c.	Tin 1, Left Tray
Opii tinctura camphorata 1=4 c. c.	Tin 1, Right Tray
Phenacetinum, 324 mgm.	Tin 1, Left Bottom
Pilulae aloini compositae	Tin 1, Left Tray
Pilulae camphorae et opii	Tin 1, Left Bottom



U. S. A. REGIMENTAL MEDICAL CHEST, MODEL OF 1901.

Pilulae carminativae	Tin 1, Right Tray
Pilulae catharticae compositae	Tin 1, Left Bottom
Pilulae copaibae compositae	Tin 1, Left Bottom
Plumbi acetas, 130 mgm.	Tin 1, Left Tray
Podophyl.li resina, 16 mgm.	Tin 1, Left Tray
Potassii bicarbonas, 324 mgm	Tin 1, Left Bottom
Potassii iodidum, 324 mgm	Tin 1, Left Bottom
Potassii permanganas, 324 mgm.	Tin 1, Right Tray
Quininæ sulphas, 200 mgm.	Tins 3, Left Bottom
Rhamni purshiana ext., 130 mgm.	Tin 1, Left Tray
Salol, 324 mgm.	Tin 1, Right Tray
Sodii bicarbonas, 324 mgm.	Tin 1, Right Tray

Sodii bicarbonas et menth, pip.	Tin	1, Right Tray
Sodii bromidum, 324 mgm.	Tin	1, Left Bottom
Sodii salicylas, 324 mgm.	Tin	1, Left Bottom
Sulphonal, 324 mgm.	Tin	1, Left Bottom
Warburg's tincture, 1=4 c. c.	Tin	1, Right Tray
Zinci sulphas, 324 mgm.	Tin	1, Left Tray
<i>Tape measure</i>	No.	1, Drawer
<i>Tea Spoon</i>	No.	1, Left Tray
Test tubes, in nests of 3	Nests	2, Drawer
<i>Thermometer, bath</i>	No.	1, Left Tray
Thermometers, clinical	No.	4, Drawer
Tins, not expendable	No.	52,
<i>Tongue Depressor</i>	No.	1, Left Tray
Towels, hand	No.	6, Left Tray
Trusses, single, either side	No.	3, Left Tray
Vials, empty, 30 c. c.	No.	18, Right Bottom
Vials, empty, 60 c. c.	No.	12, Right Bottom
Washers, rubber, extra for tins, in round tin	No.	52, Right Bottom

2. SURGICAL CHEST.

CONTENTS.

(ARTICLES IN ITALICS ARE NOT EXPENDABLE)

Alcohol	Botts,	2, Right Bottom
Alcolia, burners, filled	No.	6, Left Bottom
<i>Aspirator</i> , the rubber stopper fits the 750 c.c. botts.	No.	1, Left Bottom
<i>Bags, hot water and syringe</i>	No.	2, Left Bottom
Bandages, gauze (11 in left bottom)	No.	54, In both trays
<i>Bandages, rubber</i>	No.	2, Right Tray
Bandages, suspensary	No.	4, Left Bottom
Blank Book	No.	1, Left Tray
<i>Bottles, not expendable</i>	No.	12,
<i>Bougies</i> , in flat tin	No.	6, Left Tray
Brandy	Botts,	2, Right Bottom
<i>Cans, not expendable</i>	No.	6,
<i>Case, Gen'l. operating, with strap</i>	No.	1, Cent'r Bot'om
<i>Case, pocket operating, with cover</i>	No.	1, Left Tray
<i>Case, tooth extracting</i>	No.	1, Left Bottom
<i>Catheters, soft rubber</i> , in flat tin	No.	6, Left Tray
Chloroform	botts.	8, Right Bottom
<i>Corkscrew</i>	No.	1, Right Tray
Corks, extra for 250 and 750 c. c. botts.	No.	12, Right Bottom
Cotton, absorbent, in 30 gm. pkgs.	Pkgs.	8, Right Tray
<i>Cover for chest, not expendable,</i>	No.	1,
<i>Crate, not expendable</i>	No.	1, Used also as a stand for chest
<i>Cups, drinking</i>	No.	2, Right Tray
Gauze, sublimated, 1 meter pkgs.	Pkgs.	12, Right Tray
<i>Inhaler, chloroform, Esmarch's</i>	No.	1, Left Tray
<i>Iodoform, sprinkler</i> , filled	No.	1, Right Tray
Ligatures, catgut, 3 sizes, sterilized	No.	99, Left Tray
Ligatures, silk, 3 sizes, sterilized	No.	81, Left Tray
Matches,	boxes	6, Right Tray
Pencils, lead,	No.	6, Right Tray
Petrolatum	tins,	2, Left Bottom
Pins, common	papers,	2, Right Tray

Pins, safety	cards	8, Right Tray
Plaster, adhesive	spools	6, Right Tray
Plaster, isinglass	roll	1, Right Tray
<i>Razor</i>	No.	1, Right Tray
<i>Razor strop</i>	No.	1, Left Bottom
<i>Shears</i>	No.	1, Right Tray
<i>Speculum, rectal</i>	No.	1, Left Bottom
<i>Sponge holders, throat</i>	No.	2, Right Tray
<i>Syringe</i> , hypodermic, with 6 bottles tablets	No.	1, Drawer



U. S. A. REGIMENTAL SURGICAL CHEST, MODEL OF 1901.

Syringe, hypodermic, needles	No.	12, Drawer
<i>Surgery, Zuckerkandl</i>	No.	1, Left Tray
Tablets, antiseptic	tin.	1, Left Bottom
Hypodermic, apomorphinae hyd., 6 mgm.	bott.	1, Drawer
Atropinae sul., 0.65 mgm.	bott.	1, Drawer
Cocainae, hyd. 10 mgm.	bott.	1, Drawer
Digitalinum. 1 mgm.	bott.	1, Drawer
Morphinae sulphas, 8 mgm.	bott.	1, Drawer
Nitroglycerinum, 0.65 mgm.	bott.	1, Drawer
Quininae hydrochlo, 65 mgm.	bott.	1, Drawer
Strychninae sulphas. 1 mgm.	bott.	1, Drawer
One tube of each of the above hypodermic tablets except Quin. hydrochlo.	tubes	7, Drawer
Tablets, Saline solution, normal	tin	1, Left Bottom
Sodi carbonas, 2 gm.	tin	1, Left Bottom

Tags, diagnosis	books	4, Right Tray
Thermometers clinical	No.	4, Drawer
<i>Tourniquets, strap and chain</i>	No.	2, Right Tray
Towels, hand	No.	6, Left Bottom
Tubes, drainage, 2 sizes in flat tin	pieces	2, Left Tray
Washers, extra, for cans, in flat tin	No.	5, Left Tray
Wire, silver	coil	1, Drawer

3. STERILIZING CHEST.

CONTENTS.

(ARTICLES IN ITALICS ARE NOT EXPENDABLE)

Acidum Carbolicum	botts.	2, Under Tray
Alcolia, in 1 Kilo tins	tins	2, Front
Alcolia, burners, filled	No.	6, front 2 in tray
<i>Apron, rubber</i>	No.	3, In Sterilizer
Bands, rubber	No.	32, In Setrilizer
<i>Basins, rubber</i>	No.	4, In Sterillzer
Brushes, hand, scrub	No.	6, In Tray
Cans, tin,	No.	6.
Corks, for 250 c. c. botts	No.	6, In Tray
Cots, finger	No.	16, In Sterilizer
<i>Cover, canvass for chest,</i>	No.	1,
<i>Crate for Chest</i>	No.	1, Used also as a stand for chest
<i>Filter, with stirrup, intake tube, directions, extra washers and extra cylinder,</i>	No.	1, Bottom,front
<i>Gloves, rubber</i>	pairs	4, In Sterilizer
Matches	boxes	6, In Tray
Plaster of Paris, in 1 Kilo tins	tins	2, Under Tray
<i>Pouches for gloves</i>	No.	2, In Sterilizer
Soap, green, in 500 gm. tins	tins	2, Under Tray
Soap, germicidal	cakes	5, In Tray
<i>Soap Box, with soap</i>	No.	1, In Tray
Splints, wire gauze	pcs.	12, Front
Splints, wood	pcs.	10, Front
<i>Sterilizer, instrument and dressing</i>	No.	1, Back
Tags, diagnosis	books	4, In Tray
<i>Tool, Universal</i>	No.	1, In Tray
Towels, hand, (12 under tray)	No.	24, In Sterilizer
Trikresol	botts.	2, Under Tray
Washers, rubber, extra for cans	No.	8, In tin can in tray.

DIRECTIONS FOR FILTRATION.

The directions printed on cloth which accompany each Berkefeld filter should be closely complied with.

The Maignen filter simply clears the water by removing the solid matter in suspension. Filtration through it should be regarded as preparing the water for the smaller filter. It cannot be depended upon to render a suspicious water safe to drink. Unless the water is perfectly clear, the Berkefeld filter quickly becomes clogged, pumping if continued becomes laborious, and there is danger that the pump will break under the increased pressure. Some experiments would also seem to indicate that bacteria may be forced through the filtering cylinder if the pressure is greatly increased. The Maignen filter should therefore be first used if the water is even slightly turbid, and the cylinder of the Berkefeld filter should be removed and brushed clean as soon as the pumping becomes difficult.

The Berkefeld filter if not sterilized by frequent boiling allows the passage of bacteria even under moderate pressure, and may in time furnish a water which contains a larger amount of bacteria than the same water unfiltered. *It must be distinctly understood that the main reliance for the sterilization of water should be upon boiling.* The filters are intended to be used to supply water on the march or under other conditions where it is not practicable to boil water.

DIRECTIONS FOR USING THE BOECKMANN STERILIZER.

Open the swinging supports underneath the Sterilizer. Place two alcohol burners in the metal frame so that the flame from each will come in contact with the bottom of the Sterilizer at equal distances from the central opening.



U. S. A. REGIMENTAL STERILIZING CHEST, MODEL OF 1891.

Remove the wire tray from the water pan and fill the latter two-thirds full of water. Place the articles to be disinfected in the sterilizing chamber placing the cover on this chamber, being sure to remove the brass cap from same. Place the outer cover over the chamber, leaving the metal cap in place. The generated steam collecting underneath the cover will find its way into the chamber, forcing the air from the latter out through the opening in the bottom of the apparatus. All surplus steam will pass out through the same opening.

After sterilizing for twenty minutes, remove the outer cover and the sterilizing chamber. If instruments are to be sterilized, lay them in the wire tray and place the latter in the boiling water. Return the sterilizing cham-

ber and outer cover, removing the metal cap from the latter. Heated air will then pass upward through the apparatus, thoroughly drying the contents. After boiling five minutes, the dressings and instruments may be removed. If the opening in the cover of the sterilizing chamber be closed with the metal cap, it may then be inverted and used as an instrument tray.

Be particular to thoroughly dry the sterilizer after using it.

4. DETACHED SERVICE CHEST. CONTENTS.

(ARTICLES IN ITALICS ARE NOT EXPENDABLE)

<i>Acidum carbolicum, cryst.</i>	tin	1,	Left Bottom
<i>Aprons, rubber, (in bag)</i>	No.	2,	Left Tray
<i>Bands, rubber (in pouch)</i>	No.	16,	Left Tray
<i>Bag, hot water and syringe</i>	No.	1,	Right Tray
<i>Bag for towels, etc.,</i>	No.	1,	Left Tray
<i>Bandages, gauze (18 under right tray)</i>	No.	95,	Both Trays
<i>Bandages, plaster of paris</i>	No.	6,	Right Bott'm
<i>Bandage, rubber</i>	No.	1,	Left Tray
<i>Basins, rubber (in bag)</i>	No.	2,	Left Tray
<i>Bottles, large.</i>	No.	3,	
<i>Bismuthi subgallas, pulv.</i>	tin	1,	Left Bottom
<i>Bismuthi subnitras, pulv.</i>	tin	1,	Left Bottom
<i>Blank book</i>	No.	1,	Small Tray
<i>Boxes, ointment wooden in nests of 3</i>	nests	8,	Right Tray
<i>Brushes, hand, scrub</i>	No.	6,	Left Tray
<i>Cans, tin, not expendable</i>	No.	21,	
<i>Case, pocket operating</i>	No.	1,	Left Tray
<i>Catheters, soft rubber, in tin</i>	No.	3,	Left Tray
<i>Chloroform (bottles not expendable)</i>	Botts,	3,	Left Bottom
<i>Cots, finger, rubber, (in pouch)</i>	No.	8,	Left Tray
<i>Cotton, absorbent, 1 oz. packages</i>	No.	26,	Right Bott'm
<i>Cover, canvas, for chest</i>	No.	1,	
<i>Crate for chest</i>	No.	1,	Used also as a stand for chest
<i>Cup, drinking</i>	No.	1,	Left Tray
<i>Envelopes for tablets</i>	No.	150,	Left Tray
<i>Forceps, hemostatic</i>	No.	6,	Left Tray
<i>Forceps, tooth extracting</i>	Set	1,	Left Tray
<i>Gauze, iodoform, 1-2 meter packages</i>	No.	14,	Right Bott'm
<i>Gauze, sublimated, 1 meter packages</i>	No.	35,	Right Bott'm
<i>Gloves, rubber, in pouch (in bag)</i>	No.	2,	Left Tray
<i>Inhaler, Esmarch's</i>	No.	1,	Right Tray
<i>Iodoform sprinkler, filled</i>	No.	1,	Right Tray
<i>Ligatures, cat gut, sterilized</i>	No.	24,	Left Tray
<i>Ligatures, silk, sterilized</i>	No.	21,	Left Tray
<i>Magnesii, sulphas, cryst.</i>	tin	1,	Left Bottom
<i>Medicine glass (in cup)</i>	No.	1,	Left Tray
<i>Mortar and pestle</i>	No.	1,	Left Tray
<i>Pencils, lead</i>	No.	2,	Left Tray
<i>Petrolatum</i>	tin	2,	Left Bottom
<i>Pins, common,</i>	paper	1,	Left Tray
<i>Pins, safety</i>	card	1,	Left Tray
<i>Plaster, rubber, adhesive</i>	spools	3,	Right Tray
<i>Plaster, sinapis</i>	tin	1,	Left Tray
<i>Pouches for gloves</i>	No.	1,	
<i>Razor</i>	No.	1,	Left Tray

<i>Razor Strop</i>	No.	1, Left Tray
<i>Shears</i>	No.	1, Small Tray
<i>Soap, germicidal</i>	cakes	2, Right Tray
<i>Soap box with soap</i>	No.	1, Left Tray
<i>Spatula</i>	No.	1, Small Tray
<i>Sponges, cotton, compressed</i>	box	1, Right Tray
<i>Spoon, tea</i>	No.	1, Small Tray
<i>Syringe, hypodermic, with 6 bottles of tablets</i>	No.	1, Left Tray
<i>Syringe, hypodermic, needles</i>	No.	12, Left Tray
<i>Tablets, antiseptic</i>	tin	1, Left Bottom



DETACHMENT MEDICAL AND SURGICAL CHEST. MODEL OF 1901.

Glycyrrhizae mist. comp.	tin	1, Left Bottom
Hydrargyri mite 130 mgm	tin	1, Left Bottom
Hypodermic, Apomorph. hyd	bott. 1	
Atropinae sul	bott. 1	
Cocainae hyd	bott. 1	
Digitalinum	bott. 1	
Morphinæ sul.	bott. 1	
Nitroglycerinum	bott. 1	
Quin. hyd	bott. 1	
Strychninæ Sul	bott. 1	
Phenacetinum	tin	1, Left Bottom
Pil. camph. et opii	tin	1, Left Bottom
Pil. carminativae	tin	1, Left Bottom
Pil. cath. comp.	tin	1, Left Bottom
Pil. copaib. comp.	tin	1, Left Bottom

Potassii brom-	tin	1, Left Bottom
Quin. sul.	tins	3, Left Bottom
Sodii salicylas	tin	1, Left Bottom
<i>Thermometers, clinical</i>	No.	6, Small Tray
<i>Tongue, depressor</i>	No.	1, Small Tray
<i>Tourniquet, strap and Chair</i>	No.	1, Left Tray
Towels, hand (in bag)	No.	6, Left Tray
Tubes, drainage, 2 sizes in tin	No.	2, Left Tray
Washers, extra for tins, in tin	No.	16, Left Tray

5. MESS CHEST.
6. FOOD CHEST.
7. COMMODE CHEST.
8. FURNITURE CHEST.
9. RANGE.
10. FILTER.
11. HAND LITTERS.

As you know, during the Spanish-American war and since, we used the chests adopted in 1898. Five chests made up the set—2 medical, 2 surgical, and 1 sterilizer, and while they met the conditions, yet they were open to criticism. At the close of that war, the Surgeon General convened a Board of Medical Officers to consider the entire subject of sanitary equipment from the standpoint of active service conditions. A very important part of the result of their deliberations is the regimental hospital equipment now before you, for the assembly and arrangement of which great credit is due Major Geo. E. Bushnell, Surgeon, U. S. A. The Department is indebted to Mr. Chas. Truax for a number of valuable suggestions in the technicalities of packing; he is the contractor for the manufacture of the chests now before you.

This suggests another question which must have impressed itself upon your minds, and that is the exceeding desirability of having uniformity of equipment in the national guards of the different states and in the regular service. If there is any suggestion you have to offer as a compromise between what you require and what we here offer, I should be glad to have it as it will be better to make a chest that can and will be universally used than for each State to have its own equipment different from ours, a fact which if not now appreciated

will be when the nation is again in arms and our present Guard surgeons become a part of the national forces.

I would be glad to have you look over this equipment and consider it from all points of view, and then let us know what you want and we will see what compromise can be made, if compromise be necessary.

DISCUSSION.

MAJ. M. R. Root, Colo.—I do not know that there is much more to add to what has been said as to the uniformity of equipment. I think the equipment should be as nearly uniform with that of the regular army as possible. As to uniformity of organization that also strikes me as being of great importance, keeping as close as possible to the regular establishment and following in its footsteps. In case we should be called into the field, as we were in the Spanish-American war, it would avoid a good many complications in the national guard that existed heretofore. In Colorado we keep as close as possible to the regular establishment, in the dispensing of supplies, drugs, etc., and we would be pleased to hear expressions from members from different states as to what would be the proper course to pursue in bringing about a uniform organization and equipment in the medical department of the national guard.

LIEUT. COL. JOS. K. WEAVER, Pa.—I was not present when the matter was brought up and discussed, but I am very glad to add my tribute to and concurrence in what has been said along those lines. In Pennsylvania we have for several years endeavored to conform ourselves to the army branch in our equipment so far as it was possible to do so. A year ago or more I furnished the national guard regiments of Pennsylvania something like the chest then in use in the army, but I observed this morning that they have changed their equipment somewhat, yet ours sufficiently approximates it to make them practically the same thing. The efficiency of the guard is greatly increased I am sure by approximating so far as we possibly can to the equipment of the regular army. In Pennsylvania as a matter of economy and convenience we have made up a medical and surgical supply list. The chests come from a pharmacist who has the contract for furnishing them, and when called for these chests are sent to the regiment with the supply lists of contents accompanying them, so that every surgeon knows what is in them, and he is expected to

treat such complaints and ailments as come to his notice with what is in those chests. By this, we save a great cost to the state, we make a uniformity of equipment so far as the drugs are concerned, and we get better results than if the surgeons made out their own requirements. We get all the standard drugs, we save the trouble of transportation, we get drugs that are thoroughly reliable and that are all familiar to our surgeons who are all of them men of experience, many of them having seen service in the last war.

I believe there is room in our army for improvement along this line of medical and surgical supplies. I believe the supply list can be greatly simplified at a great saving to the government aside from the score of greater convenience.

I observe the tablets and triturations are put up in japanned tin, which is a great improvement over ours which are in glass and liable to be broken.

I am glad to see this exhibition of equipment and we should aim to keep as closely as possible to this standard. The great fault of our surgeons during the war was the lax way they did their paper work, and if we can adapt our blanks as nearly as possible to those of the army, simplify them somewhat, making them less numerous, I believe our surgeons will have no difficulty whatever in making out their requisitions and keeping track of everything that goes out and comes in. I am in favor of an effort being made upon the part of the national guard to make its equipment conform in every respect to that of the regular army as near as it is possible to do so.

I think when the national guard of Pennsylvania starts out it will be very difficult to distinguish the equipment of a volunteer soldier from that of a soldier of the regular army.

COL. W. W. GRANT, Colo.—I think no good man would doubt the desirability of having the national guard in every state of the union absolutely the same in equipment, rank and organization as the regular army. It seems to me it would simplify the work in every respect and every man would know what he is to meet when brought in contact with other people. How is it to be done, by statutory or congressional action? I cannot exactly settle that question. We can exercise our medical influence to bring it about in our own states, but there should be uniformity of action throughout. The statutes of Colorado settle the matter as far as it is possible to do so. We have six surgeons outside of the surgeon general. I am subject only to the order of the governor and the hospital corps is under my order. That is the way it should be all over the country, but I venture to say it is not so. How to bring this

about is the question, and this discussion may bring out the best way to go to work about it.

MAJOR J. VAN R. HOFF, U.S.A.—It seems to me the key note of the situation is struck by the Surgeon General of Colorado in his statement that we must have uniformity of organization and equipment in the medical department of the State troops, and then of course these organizations and equipments must correspond as closely as possible with those of the regular establishment. We recognize that the regular establishment is yet by no means perfect, but we are striving to make it as perfect as possible.

One reason why I had these chests brought here yesterday was to invite criticism upon our present equipment, with a view to its perfecting, for I believe, Mr. President, among the most important things this Association has to do is to exert its influence to bring about a perfect organization and equipment of our medical departments, state and national.





THE PENNSYLVANIA BRIGADE HOSPITAL, TÉNÉ.—1900.

THE PENNSYLVANIA BRIGADE HOSPITAL TENT.

BY LIEUTENANT HERBERT A. ARNOLD.

ARDMORE, PENNA.

ASSISTANT SURGEON IN THE NATIONAL GUARD OF
PENNSYLVANIA.

THE ANNUAL ENCAMPMENTS of the National Guard furnish an opportunity for practical study and experimentation along the line of the best care for the sick and disabled.

The Pennsylvania National Guard is not satisfied with past accomplishments or present attainments, but seeks to add to the comfort and facilitate the return to duty of every citizen soldier who is so unfortunate as to be incapacitated for duty during his active service. Of our number there are none more zealous in looking after the Pennsylvania guardsman's welfare than our division quartermaster, Lieutenant Colonel W. F. Richardson, who, as Superintendent of the State Arsenal, has facilities for putting into execution his ideas of shelter and comfort.

This tent, which Col. Richardson designates "The Pennsylvania Brigade Hospital Tent," is described by him as follows:

"Length of tent 32 feet.

Width of tent 18 feet.

Divided into two apartments 16x18 feet.

Apartments fastened on wall by snap hooks and rings.

Height of wall 5 feet 2 inches.

Two ridges each 16 feet long.

Three uprights each 12 feet 9 inches.

Nine side poles one either side each 5 feet 9 inches.

Fly on top.

"One end of this tent, 16x18 feet, is equipped as a regular hospital, with six cots furnished complete, with mosquito bars attached to each cot; also writing table, wash stand, commode,

slop bucket, pitcher and bowl, strips of carpet in front of each cot, small table between the cots, two rocking chairs and two folding camp chairs, and floored.

"Ventilation on each end of the tent that works by ropes, dropping ventilator down when required.

"The entire wall can be taken off of either side as they are fastened by snap hooks on wall to a ring sewed in on eave of tent.

"The tent is properly protected from storm by guy lines, and when properly erected it is the most complete and substantial tent of the kind ever used for any field purpose."

Pennsylvania, in addition to the annual encampment of the entire division, provides also for annual rifle matches when teams from each regiment of infantry and troop of cavalry spend a week at Mt. Gretna in a model camp.

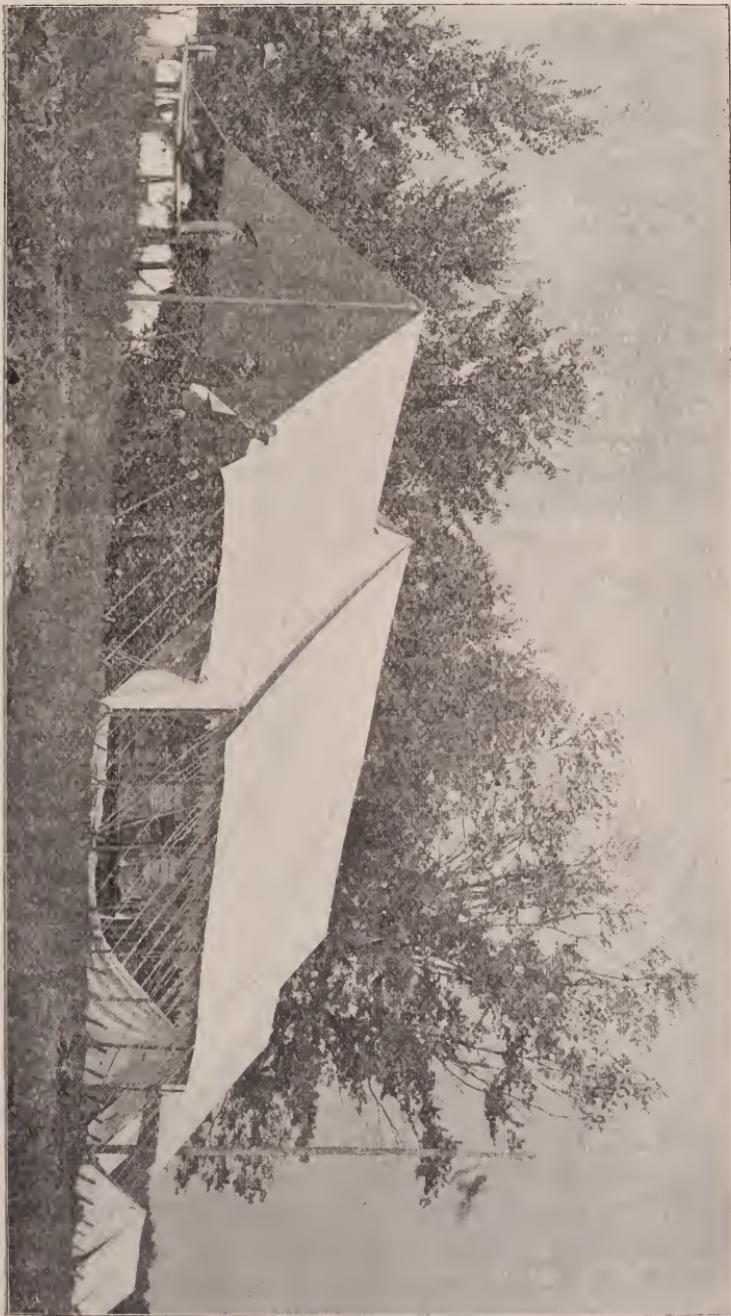
The hospital tent just described was used for the first time at the camp during the rifle matches September 1900, and having had the honor to be detailed as medical officer during the matches it was my privilege to first test it in a practical manner.

It is not necessary to further describe it, except to call your attention to the fact that the central partition may be separated in the same manner as the end wall of the regular hospital tent, or may be entirely detached, making one apartment 18x32 feet. This space is larger than two conjoined ordinary hospital tents, which are each 14x15 feet.

The necessity for a well ventilated, strongly constructed yet easily managed hospital tent for tropical service was never so great as now, when American troops, in Cuba, Porto Rico and the Philippines are for the first time experiencing campaigning under conditions that call constantly for tentage that will afford shelter without oppression.

The special feature of this tent is its detachable wall. The wall of the ordinary hospital tent must be reefed up along one entire side at least to present a neat appearance, and even then the wall interferes to a certain extent with ventilation; whereas the wall of this tent may be partially detached at either side, dropped along one or both sides, or entirely removed. In this way free ventilation may be se-

THE PENNSYLVANIA BRIGADE HOSPITAL TENT.—WALL LOWERED.



cured for some cots while others are sheltered, and yet the tent will preserve a neat appearance.

Temporary privacy may be obtained by raising the wall opposite one or more cots. The facility with which this may be accomplished is a matter of which I can speak from experience.

Sagging of the sides of the tent is prevented by detachable side poles. These poles also serve to give stability to the tent.

The ventilating openings at each end, near the ridge, are covered by flaps that may be instantly raised or lowered by means of ropes passing through rings.

A glance at the accompanying photographs will show a system of bracing that enables the tent to withstand very severe wind storms.

While encamped in the mountains of Porto Rico, a cloud-burst a few miles beyond us caused a rapid rise in the creek near our camp, and necessitated the hurried abandoning of our tents in consequence of inundation. Three feet of water ran through our hospital camp. Our tents remained standing, and on recovering them next morning the walls were in a wretched condition from the deposition of filth left by the receding water. With a tent of this character the removal of the side walls would have left the roof and fly above the water and the tent uncontaminated.

In the event of soiling, the detachable walls may be more readily cleansed and handled than those inseparably fastened to the roof.

I have endeavored to give you, as briefly as possible, the salient points of advantage in the Pennsylvania Brigade Hospital Tent, and commend it to your notice as worthy of extended trial, feeling satisfied that it will meet all demands and prove a boon to the unfortunates whom the Medical Department strive earnestly to return to duty at as early a date as possible.

Personal experience enables me to testify as to its practi-

cability, and declare the tent beyond the stage of experimentation.

Ardmore, Pa., May 17, 1901.

DISCUSSION.

P. A. SURG. C. P. WERTENBAKER, U.S.M.H.S.—I would like to ask Lieut. Arnold as to the color of the canvas used, whether it is white or khaki?

LIEUT. H. A. ARNOLD.—The color was white; we use no other color in the national guard.

P. A. SURG. WERTENBAKER—Can you give an idea of the cost of manufacture of the tent?

LIEUT. ARNOLD—I can get that from Col. Richardson; he can give the cost at any time.

P. A. SURG. WERTENBAKER.—I have a good deal of that sort of thing to do in detention camps, and I am interested in the details.

LIEUT. ARNOLD.—Col. Richardson can give you all the details. The cost of everything manufactured can be accurately computed.

LIEUT. COL. JOSEPH K. WEAVER, Pa.—I would like to say a little about this tent which is one that fills a long felt want so far as the care of the sick is concerned in the encampment. During the last war it was demonstrated that there was need of a regimental and brigade hospital. In our three brigades we used one of these tents as a brigade hospital, using the regimental hospital for temporary work for which two men are sufficient. If a man is unfitted for duty for twenty-four hours he will be sent to the brigade hospital. While we have not had practical experience with the tent we propose during the coming summer to use it as a brigade hospital. I can commend this tent to the consideration of surgeons of this Association and I shall report upon the practical use of it during our next encampment.

SOME POINTS IN MILITARY SURGICAL PRACTICE.

REMARKS BY BRIG. GEN. JEFFERSON D. GRIFFITH.

KANSAS CITY, MO.

SURGEON GENERAL, RETIRED, OF MISSOURI.

IHAVE no regular paper to submit. I have a little to say,—a very little. In our practice of the profession of medicine we live in an age which may be designated as one of co-operation and mutual helpfulness. Each day brings to light some new truth, and the medical man who imparts such truth for commercial considerations has placed upon himself a stigma that does not belong to our profession; it belongs to no physician, surgeon or otherwise, and this principle has come down to us through all medical literature.

I. I would ask the military surgeon of today to be kind enough to look to his men carefully, not to those with varicocele, not to those with hernia,—we can see those things,—but what is more necessary, examine their excretions. Lithic acid today plays one of the most important parts in all chronicled surgery. Who is it that goes into a case of surgery without examining the urine? Again take the condition, this diathesis, I do not care whether you call it gout or rheumatism, whether you find it octo-hedral, dumbbell, or what you may find it resembles, in the words rheumatism and gout you have a distinction without a difference,—that is what I mean,—practically, both due to malassimilation. Let us go to our ordinary hobby, appendicitis. How many cases of appendicular trouble there are catarrhal in character! What are they due to? Ask yourself the question. I see gentlemen here who have operated time and again. For what? Catarrhal appendicitis. Your humble servant has been the subject of several attacks of appendicitis, there is no doubt about it, but I am still on hand and expect to stay with you as long as I

can. I have not been operated upon, but I would give a good deal if I had my appendix in a bottle. The bane of the American people today is what? Lithic acid. The Englishman has gotten rid of this to some extent, because when he feeds in the morning he takes an hour and a half for breakfast, two hours and a quarter for his lunch and six hours for his dinner. (Laughter and applause). He chews on each morsel thirty-two times. He gets plenty of saliva mixed with his food so that it can commence the digestive process at once; he uses phosphate of soda at his club plenty of it instead of sodium chloride with his food. We swallow our morsel today and promise to chew it tomorrow. Whether it is in the army, the navy or in private citizenship we merely down a little bit of breakfast, we allow ourselves ten minutes for lunch and then go to dinner for half an hour. That is the size of the American man. That is the business man, that is the army, that is the navy, that is everybody. I do not know so much about the navy; it is my opinion that there they can sit down to eat, but the rest of us can't. Lithic acid diathesis and lithiasis will show up frequently soon after operative interference. It has its influence after your operation. If you have not observed it, you will notice it after you have opened a man's abdomen. Again this has not been noticed only by one or two, this habit of ours of swallowing a bolus, a mass or what you may call it, like the cow forming her cud today and chewing it tomorrow. It shows itself, and all of you who do operations have noticed it. I see our friend Dr. Marcy of Boston here, who has done more hernia work than any man I know of. I see the father of the American Medical Association here, Brother Didama, [applause] and he will tell you the same thing, as will Maj. Halley of Missouri, Col. Priestley of Iowa, and Gen. Blood of Massachusetts. Even our old friend and brother Gen. Byers of Wisconsin will tell you this is true. Again, what does this lead up to? The fact is that every one of us breathes in bacilli, it may be a tubercular bacillus, with an imperfect mucous membrane laying us wide open for any infection.

II. Again, (and now, gentlemen, I guess I am going to throw a red rag) the use of normal salt solution is questionable in any condition where the heart is unsatisfactory by reason of shock. In other words labor should not be added to this already weakened organ except for the loss of blood, actual loss of blood. Where there is a loss of blood giving rise to any depression of the pulse then it is you can afford to fill up your vessels and force more work on this central organ when under an anaesthetic. Even this is a questionable problem today. Your humble servant has been in a position where he has seen two patients go over the road by reason of the injection of a normal salt solution. I am here like the rest of you for the purpose of learning something, and I am just telling you a little of my own experience.

III. There is another thing which comes up in the army and navy which I want to speak of in just a few words. What has the medical profession done in the way of treatment of gonorrhea? "Where are we at?" That is what I mean. Let me ask you, what have we accomplished in this line? What are you going to do? What can you do? Remember that this is an evil that is with us and has come to stay. The Lord only knows where it came from, but I will tell you right now that it is one of the hardest things to deal with I have ever met in surgery. Take the sequel of this trouble, gonorrhreal rheumatism. What are you going to do for it? How are you going to cure it? This is important to us who used to belong to the army and are ready to go again when necessity calls us. How do you cure it? What is the specific? I have now under observation at home two cases of gonorrhreal rheumatism, and let me say to you that my experience is simply this: They come around for treatment, they get tired of you after a while, they see you cannot cure them and then they go to some other fellow and finally some Christian Scientist gets after them, and then when the trouble naturally subsides and goes out itself, we get blamed for not having cured it. There is no doubt about that. I am not going to weary you, but I just want to throw these things out for your discussion.

IV. There is an instrument made now to which I want to call your attention, you gentlemen of the army and navy and national guard, and that is Dr. Lee's instrument for closing intestinal perforations in gunshot wounds and other wounds of the abdomen where you are satisfied that you have perforation of the intestines. I am sorry, indeed, that I have it not here with me, but I expected to have it and I also expected Mr. Truax to bring one with him. Again, gentlemen, this instrument I speak of keeps out the assistant's hands from the abdominal cavity. You do not have to do as you do in Dr. Laplace's method or any other, or have an extra pair of hands to assist you. I speak of this as a great assistant particularly in the field where you are apt to be short handed.

V. There is another thing in the territory of surgery I want to call your attention to, and that is tendon surgery. The approximation of tendons, the uniting of tendons and of muscles. Now I want you to distinctly understand that in the trial with the muscles you are going to fail, but if you unite the tendons you will not have any trouble with them. In other words, if you have a muscle that is active get its tendons united to one that is necessary and it will rapidly develop for the purpose that you want it.

VI. I want to call your attention to another subject, and that is gloves. The rubber glove has come to stay, and wherever you want to use or make or do aseptic surgery use the rubber glove. It is now what might be called a necessity, the same as ice is a necessity, not a luxury. Wherever you are dealing with anything like a serous cavity, one that requires operative interference use the rubber glove, because a good rubber glove can be boiled and reboiled. Use it. You may reply at once that it will impair the tactile sense. It is not so. You have got to accustom yourself to the use of the rubber glove and in two months your tactile sensation is just as good as it is without. You can use the needle and you can use the knife. You can use the hemostat just as easily with the rubber glove as without it. All you have to do is to edu-

cate yourself to its use. It has come to stay, there is no doubt about it.

VII. Again the army surgeon may be placed in a position, especially in the field, where he may need an aseptic needle. I do not mean an antiseptic needle, but an aseptic needle and ligature or suture. Today you have it under your control. The needle already threaded comes to you from the very largest you have to use in hernia down to the smallest that you can use in your work. A needle two and one-half inches long you can get already threaded with large sized catgut, chromicized or otherwise, just as you want it. These needles have come to stay.

VIII. Let me say there is a subject that has been harped upon ever since Adam was born, (although I believe he was not born, "jest growed") and that is the use of the catheter. The catheter that is now used is one that you can boil. A catheter nowadays is so cheap that you only use it once. Is not that a fact? The rubber catheter is one of those things that have come to stay. But let me say, gentlemen, let me call you attention to one fact: test every one of them. I will show you a specimen of a catheter in this vial [indicating] the end of which was in a bladder three years. It is surrounded by a deposit of stone. We are all natural cowards. Be honest with yourself. In other words, don't let a man get away, if you have lost the end of your catheter, without telling him so. It is easy enough to test a catheter when you use one of rubber. This is the kind of catheter that is now most generally used. [Exhibiting soft catheter].

IX. The use of inhalation of oxygen instead of chloroform in convulsions, uremic or otherwise, even in eclampsia, is another thing that has come to stay, and the anesthesia to the central organs is perfectly wonderful. You all know how easily you can confine a little oxygen until you want it.

X. Now I will not detain you any longer, but I just want to call your attention to the fact that in army, navy and general medical practice the future of medicine and surgery depends upon the "survival of the fittest".

DISCUSSION.

COL. W. W. GRANT, Colo.—The General says he expects to throw out a red rag in reference to transfusion. I do not think he treats this question right to report two fatal cases without a history of those cases. The profession does not now have a case of weak heart without giving a normal salt solution. If you cannot fight the trouble by the use of normal salt solution I do not see how you can render any more direct service by any other means, although at times those channels are not sufficient. I believe it to be the consensus of opinion of the best physicians in the world that the saline infusion is the most valuable aid that we have today.

COL. R. H. REED, Wyo.—I cannot but commend the very valuable paper presented by our friend Gen. Griffith. It was full of meat, full of thought, full of practical points, and yet with all respect for our friend from Kansas City I feel that there are some points in the paper from which I differ and which are worthy of notice at least.

I shall not differ with the General in his paper in reference to gonorrhea. We are all aware that, with all the advantages afforded by bacteriological research and the advancement of therapeutics, we stand as far behind in the matter of successful treatment of gonorrhea today as we did one hundred years ago. Think of it! It runs its course, it is followed by stricture, by rheumatism and various other calamities that follow in the train of these troubles, and we are unable to cope with it today. It is a lamentable fact. We ought to get to the point where we can handle it the same as diphtheria is treated with antitoxin; we have not reached that point yet, but it is to be hoped that some member of this Association will reach it and give us something in the future that will accomplish the same result.

A question I have to take issue with is in reference to the use of the rubber glove. I know I am antagonizing a popular fad, a fad that is popular throughout the United States with the best surgeons, but, gentlemen, I was taught when a child that "a cat with gloves catches no mice." I am satisfied that the operator who uses the rubber glove can do no better work than the operator without the rubber glove provided the operator without the rubber glove uses ordinary surgical cleanliness. It is simply a matter of cleanliness after all. You are just as liable to get your glove soiled as your hand. If you clean your hand surgically before an operation you are going to have a clean pair of hands to put into the abdominal cavity.

or anywhere else, as clean as the rubber glove; and I know to an absolute certainty after trying them I got no better results from rubber gloves than from my naked hands, and in addition to that the tactile sense is better without the glove than with it. Our essayist says we must overcome this. You might as well say cloudy spectacles would give as clear a sight as clean ones. I do not believe the rubber glove has come to stay. I know several good surgeons, who have used the rubber glove for a considerable time, and are discarding it, for the simple reason that they are getting no better results, and for another reason that they do not have the necessary tactile sense for making an operation in the abdominal cavity. Take the difficult operation of implanting the ureter in the rectum and use the rubber glove. You cannot handle the needle, you cannot handle your instrument; and right here is a point to which I want to call your attention: Never use a needle holder if you can handle it by using your fingers. I saw a gentleman operate a few days ago who used a needle holder for the purpose of doing the most simple suturing. Do it with your naked fingers; they are better than the best needle holder you can get. I frequently have young railroad surgeons come to me and ask what kind of splints they should use. I say to them every time, get your own splints. If you have not the surgical knowledge, if you have not the ability at any time to handle a fracture or any part of a surgical operation in a way that may be suggested by your own mechanical ingenuity, do not go into the field of surgery. So I say in the field of instruments use your own common sense, but use as few instruments as possible and use them as little as possible.

Another point brought out in the speaker's remarks was the use of needles and catgut put up in bottles. Do you know whether such material is aseptic or not. No, you have no way of knowing whether it is aseptic or not. The manufacturer is not interested in the operation in which life or death is concerned. Not a bit of it. He is making the needle and the catgut to sell, but you are using them to save your reputation and the life of your patient. I prefer to prepare my own needles and catgut to any that are prepared in the United States or any other place. I have used these needles and used the catgut and have been disappointed in them. It is perhaps more convenient and cheaper to use those needles and the catgut than to prepare them yourself, but where you have trained yourself to use good ones you do not want to use anything else, and I am opposed to the use of catgut and needles unless

you positively know they are surgically aseptic or unless you cannot get any other. As to the use of catgut, there is no question but that catgut properly prepared, made aseptic, is much superior to any other suture material, unless it is our friend Marcy's kangaroo tail. The secret is to have everything absolutely clean, and the same secret lies in the use of the gloves and the naked hand. Take Tait, didn't he show to the world that cleanliness was the secret of his success? He hated an antiseptic surgeon, and yet he left us a pretty good record. We have many others who claim that antiseptic surgery is not the secret of success, but that the secret lies in cleanliness, and they have made good records.

LIEUT. COL. HENRY O. MARCY, Mass.—I am deeply interested in the question brought up by the last speaker. Some of you know something of the early history of antiseptic surgery. I shall only refer to the fact of Mr. Keith showing the sponges cared for by his wife, and of which he says that he had done more than one hundred laparotomies and used only those sponges. You know that there is no operator that stands higher than Mr. Keith of Edinburg. His record stands almost unsurpassed. The secret of his success is the care exercised in his technique. Mr. Tait I knew well, and we often had a little *tete-a-tete* over these matters. I think he was a false teacher for many reasons, especially, when we consider the principles of bacteriology and infection, yet he did leave us a lesson in the care and cleanliness which he exercised, and I believe I learned much in studying the record of Mr. Tait in abdominal surgery.

As to my own record of 600 operations of a major type, I show two per cent of infectious wounds and that without the use of rubber gloves. I think the last speaker referred to the use of rubber gloves. For the last two years in all of my operative work I have used the rubber glove, and I think the only consideration in using them is that I feel a little safer, although I rather agree with the speaker that the technique is not so good as before I used the rubber glove. The tactile sense is something that must be acquired and I do not see how we can help acquiring it. There are different kind of gloves and there are different ways in which they may be prepared, and it is not always certain that the manufacturer can give us a uniform result. All of us who know the danger of infection of the epithelium must acknowledge the risk and danger to the patient from the operator's hands. Every other place can be reasonably well protected. There are a good

many surgeons who do not agree on that epithelial protection. I think the use of the gloves makes an operation safer.

I disagree with the doctor when he says that muscle suturing does not unite with the tendon, because I believe if the operation is properly done there will be no difficulty in that direction.

BRIG. GEN. J. D. GRIFFITH, Mo. [*Closing discussion*]—I have nothing to say except to reply briefly to Colonel Reed. I simply want to ask him how he can keep the sweat glands of the face clean? How long and how often does he clean his nails, and how does he know that his assistants observe all those things?

I once more say that the rubber glove has come to stay and I see no reason for changing my opinion. Again, Mr. President, I want to say about this glove, you can boil it as long as you please. If there is anything in Mr. Tait's whole experience of teaching it lies in this fact of cleanliness. I don't care how dirty the water looks, boil it. There are not many bugs that live more than twenty minutes at a temperature of 212 degrees. Put your ligature into it. When it comes to this union I am sorry to say I have opened several abdomens. I have done a little celiotomy, laparotomy, etc., and I have not been as fortunate as I might have wished although I used a suture in different lines. I have used several lines of sutures in trying to approximate tissue. I have had some hernias. With regard to this subject of bacteriological work I can say again as I said before, I believe that this is a survival of the fittest and it lies in the future, what we have to do. It is the survival of the fittest.



Editorial Department.

THE NEW DEPARTURE.

THE publication of a journal, devoted to military medicine, surgery and sanitation, under the auspices of the Association of Military Surgeons of the United States has long been a cherished project of many of the more active members of the Association. Propositions looking toward that end, have, however, from time to time been laid aside as inexpedient or untimely. The value to the Association of such a publication has never been denied, but hitherto one or more of the factors essential to success has apparently been lacking whenever the subject has arisen for consideration. This condition prevailed up to so recent a period as the last annual meeting of the Association, but shortly after its adjournment the way for the inauguration of periodical publication opened up so clearly that, by the unanimous vote of the Executive Committee, it was determined to enter at once upon the journalization so long anticipated. The present number is the outcome of this decision.

This issue, the initial publication in journal form, consists of the proceedings and papers of the St. Paul meeting, the brevity of the program on that occasion rendering it possible to include all the exercises in a single number. Future issues, however, will conform more closely to journalism of the more conventional type.

The Journal will be published quarterly during the present Association year, but arrangements are in preparation by which it will be possible to issue it monthly thereafter. The contents of the remaining numbers for the year 1901-1902 will consist of original memoirs, reprints, translations and ab-

stracts, together with some editorial comment in various forms, all pertaining to the domain occupied by the Association. Much attention will be paid to inventions and advances along medico-military lines, and the personal phase of medico-military service will receive special consideration.

The aim of the Journal, like that of the Association of which it is the offspring, will be to fulfill its logical mission of encouraging the development of military medicine, of inspiring progress in military surgery, of fostering growth in military sanitation, of adding to the effectiveness and influence of the military medical officer, and of increasing the efficiency of the Association in the accomplishment of its declared purpose "to promote and improve the science of Military Surgery,"

THE ENNO SANDER PRIZE.

SPECIAL encouragement is hardly necessary to excite interest in the question of the organization of the medical department of the army in active hostilities. The Spanish war and its corollary the hostilities in the Philippines are too recent for the struggles of the medical department in the endeavor to obtain suitable facilities for the care of the disabled to be forgotten. The storm of undeserved criticism which beat upon the medical officers in their masterly and ultimately successful efforts to afford to the sick and wounded the best possible care, is too fresh in the memory of its victims to necessitate much urging for them to speak freely upon a subject which so deeply interests them.

The choice then of the subject for the Enno Sander prize contest this year is a peculiarly happy one, not only on account of its intrinsic value to the profession of arms and the science of medicine, but because of the absorbing interest felt

in the subject by so many intelligent and accomplished officers who have been both practically and theoretically employed in the efforts to solve the problem.

While perhaps the truly scientific spirit needs no incentive other than the good he may accomplish, yet it is to be hoped that the generous consent of Major Sander to double the amount of the prize this year may afford to possible competitors at least an indication of the high estimate in which the subject is held and prove both a moral and practical stimulus to the highest grade of work in connection with the competition.

THE LITERARY PROGRAM FOR THE ELEVENTH ANNUAL MEETING.

THE LITERARY COMMITTEE of the Association is meeting with encouraging success in its work of preparation for the next meeting and a number of valuable and interesting papers have already been promised. It is hoped that those who intend to write will not delay, lest the pressure of other duties may at the last interfere entirely. Papers that come in early and are of immediate interest, will, if possible, be published in the Journal before the next meeting.

The Committee is particularly desirous of contributions from members who are or have been in active service abroad. Very little has as yet appeared in our Proceedings illustrative of the work of medical officers in Cuba, Porto Rico, the Philippines or China and the omission ought to be supplied, while memory of the events is fresh.

The Committee may not be able to reach by personal letter some who are prepared to write, and trusts they will not wait, but send in at once the subject chosen, to the Chairman of the Committee, Colonel C. H. Alden, U.S.A., Retired, Newtonville, Mass.

THE PERSONAL RECORD.

DURING the Summer, blanks have been distributed throughout the Association as the foundation for a personal record of the membership. These blanks, when received, are arranged after the card catalogue style in suitable file cases and constitute a biographical work of the highest value. There are still a few members who have not returned their blanks, and a few who failed to enclose a photograph with the record. These members are urged to complete the forms without delay.

THE WASHINGTON MEETING.

THE selection of Washington as the location of the eleventh annual meeting and the 5th, 6th and 7th of June next as the date of convening, insures a successful meeting from every point of view. The arrangements are already taking tangible shape, and at an early date, it will be possible to make some definite announcements with regard to them.



Topographical List of Members.

THIS list is arranged alphabetically primarily by States and services, and secondarily by post-offices. The names of those members residing in the same place are again arranged alphabetically. The names of Associate, Corresponding and Honorary Members are in italics.

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 Major Joseph B. Whiting, Jr., Janesville, Wis.
 Major Theodore W. Evans, 3 Pinckney St., Madison, Wis.
 Gen. John B. Edwards, Mauston, Wis.
 Major Edward H. Grannis, Menominie, Dunn Co., Wis.
 Capt. Ralph Chandler, 13 Grand Ave., Milwaukee, Wis.
 Capt. William J. Cronyn, 245 14th St., Milwaukee, Wis.
 Major John R. McDill, U.S.V., 200 Wisconsin St., Milwaukee, Wis.
 Gen. Frederick Weils Byers, Monroe, Wis.
 Major Frederick J. Wilkie, 61 Merritt St., Oshkosh, Wis.
 Capt. William W. Wilson, 620 3d St., Wausau, Wis.

WYOMING.

Col. R. Harvey Reed, Rock Springs, Wyo.

FOREIGN COUNTRIES.

Docent Dr. Otokar Kukula, K. K. Assistenzarzt, Prague, Austro-Hungary.
M. G. M. F. Vanderlinden, Inspecteur général de service de santé militaire, Saint-Josseten Noode, Belgium.
General William Silver Oliver, 127 South Park St., Halifax, Canada.
Surg. Lt. Col. Fred. W. Borden, Ottawa, Canada.

Surg. Lient. Col. J. L. H. Neilson, Ottawa, Canada.
Surg. Lt Col George Sterling Ryerson, 60 College St., Toronto, Canada.
Sir W. Mitchell Banks, M. D. 28 Rodney St., Liverpool, England,
Surg. Col. William McWatters, Care Holt & Co., 3 Whitehall Place, London, England.
Sir J. O'Neill, C. B., Surg. Gen. (Ret.), Indian Med. Service, London, England.
Surgeon Captain Rory Fletcher, Care Capt. A. K. Fletcher, Hillcroome, Sutton, Surrey, England.
General Stabsarzt, Prof. Dr. E. von Bergmann, Kriegs, Ministeriums, Berlin, Germany.
Excellenz Generalarzt Prof. Dr. Fr. von Esmarch, Kiel, Germany.
Excellenz Generalarzt, Dr. Eduard von Fichte, Stuttgart, Württemberg, Germany.
Lt. Commander Dr. Tomat Suri, Surgeon, Imperial Japanese Navy, Tokyo, Japan.
General Epifanio Cacho, General Jefe del Cuerpo Medico, Militar, Mexicano, Ciudad Mexico, Mexico.
Coronel Fernando Lopez, Coronel Medico Ciruj., Director Hosp. de Mexico, Ciudad Mexico, Mexico.
Tente Cor. Zacarias R. Molina, Cuerpo Medico Militar Mexicano, Vera Cruz, Mexico.
Major Narciso del Rio, Cuerpo Medico Militar Mexicano, Vera Cruz, Mexico.
Captain Hans Daal, Sanitary Captain, Norwegian Army, Christiania, Norway.
Prof. Julius Nicolaysen, University of Norway, Christiania, Norway,

- Generalmajor Johan Frederik Thaulow.* Medicinalråd Edvard Martin Edholm,
Sanitetsgeneral og Chef, Kongelige Ofverfalthakare vid armén,
Regerings Forsvars-Department, Stockholm, Sweden,
Christiania, Norway.
- Dr. Adolph Alexandrovitch Remert,* Staff Surgeon Swedish Navy,
Inspecteur général de service de santé Stockholm, Sweden.
militaire, Ingineraia and Bolchaia
Sadovaia Streets, St. Petersburg, Russia.
- General Thien Ho,* Colonel Adolf Ziegler,
Med. Inspector General Siamese Army, Médecin en chef de l'armée fédérale Suisse,
Bangkok, Siam. Departement militaire,
Berne, Switzerland.



Original Memoirs.

A MANILA MILITARY HOSPITAL.*

By JOHN S. KULP, M. D.

NEW YORK CITY.

CAPTAIN MEDICAL DEPARTMENT, U. S. ARMY; MAJOR AND
SURGEON OF UNITED STATES VOLUNTEERS.

IN THE Spring of 1899 there was need of another hospital in Manila, and permission was obtained to establish "Supplementary Wards." Circumstances beyond the control of the Medical Department, and which I am not at liberty to explain, made it necessary that the number of medical officers and men should be the smallest consistent with supplying ordinary service to the sick. The place allotted was a dilapidated Spanish Barracks surrounded by filthy moats, but in an excellent location. One of the most able and energetic officers of the corps was placed in command and given two assistants, of which I was one†. The idea from the onset was the establishment of a military institution, rather than a hospital managed on the lines of civil institutions by a more or less military personnel. The reasons for this were (*a*) the economy of labor necessary, (*b*) the advantage of thorough discipline, (*c*) the utilization of the institution for instruction, and (*d*) because it was believed that the systematic control available in military organizations insured the highest efficiency.

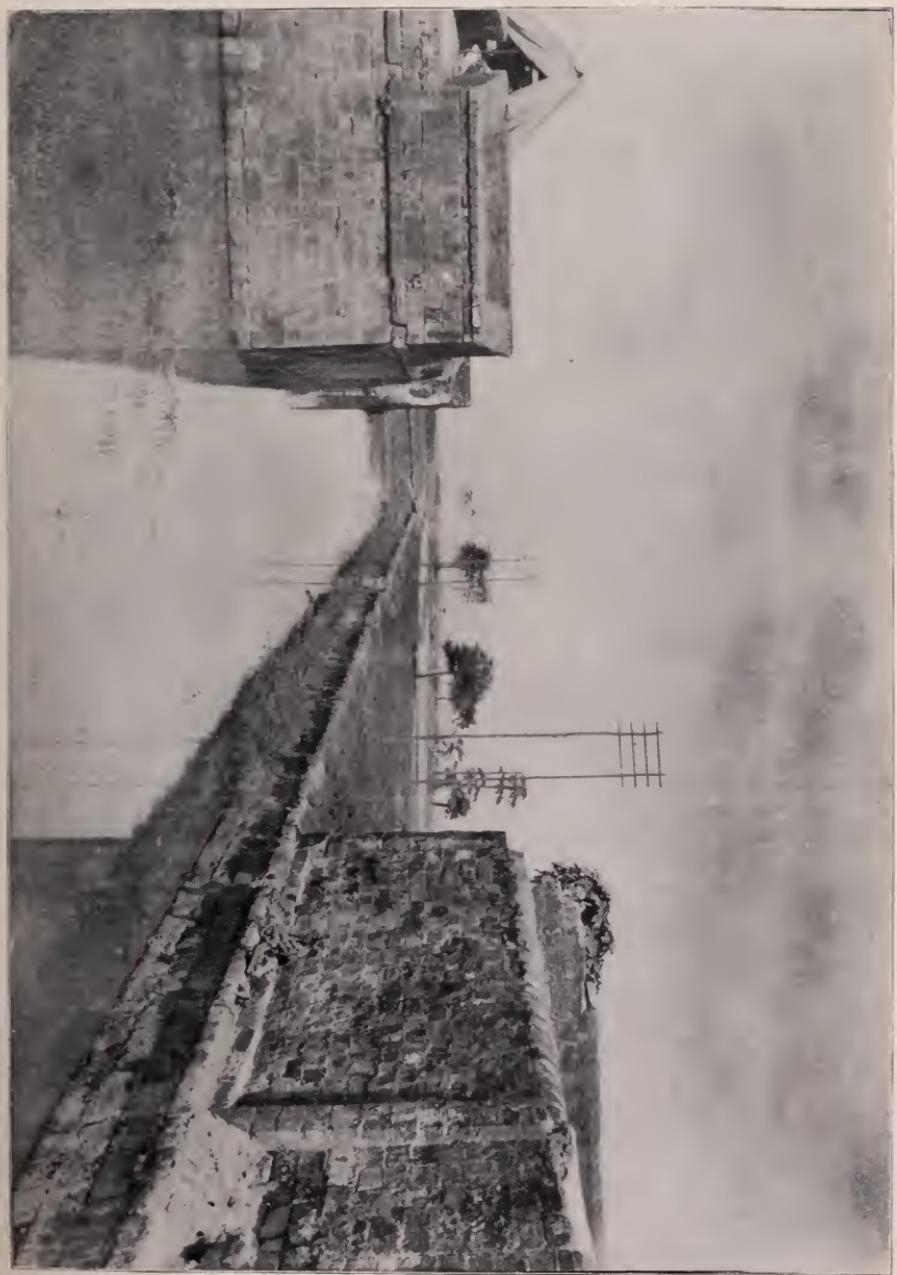
The situation was on the Paseo de Aguadas near the bay and adjoining the Luneta, a part of whose ancient fortifica-

*In complying with the JOURNAL'S request for an article on this subject I have used unsparingly several official reports for which I am indebted to the courtesy of the Surgeon General.

†Captain Kulp succeeded Major Kendall in August 1899, and remained in command until May, 1901.

MOAT AND WALLS SURROUNDING HOSPITAL THREE BEFORE USE BY THE MEDICAL DEPARTMENT.





MOAT AND WALLS SURROUNDING HOSPITAL THREE MONTHS AFTER OCCUPATION BY THE MEDICAL DEPARTMENT.

tions are about the post. Many years ago Manila's first military hospital was built on this spot and was destroyed by an earthquake. From its ruins arose the composite stone buildings of the engineer corps, which fell during the all-night convulsion of 1863, only to be again rebuilt, and again destroyed by the short violent upheaval of July, 1880. The ground was then graded and the present buildings begun so that in January, 1881 they were ready for occupancy. Even then the engineers had no rest. At the first inspection, the inspecting officer seeing that the new barracks were superior to those of his own troops, (the Cuartel Meisic) ordered a transfer. The incoming regiment was the famous 73rd Cazadores, or Huntsmen, composed of native Visayans officered by Spaniards. This regiment, about eight hundred strong, occupied the barracks until the investment by our troops on 13th August, 1898, after which they were occupied successively by California, Pennsylvania, and Kansas volunteers.

The institution then consisted of seven large wooden buildings, each having a single story elevated three feet above the ground. The ceilings were high and the ventilation practically perfect. The general plan was that of a triangle attached to a square:. Around the sides of the square were the six wards each having an average capacity of forty-eight beds, while occupying the two outside arms of the triangle were the baths, laundry, main kitchen, paring room, cold storage, carpenter and paint shops, commissary, quartermaster and ordnance storerooms, and the commanding officer's quarters. In the administration building, which forms the front of the square were the offices of the commanding officer, officer-of-the-day, registrar, and dentist as well as the laboratory, consultation room, medical storeroom, dispensary, baggage room, printing office, and linen room. Ward F, (acute surgical) which is also in this building, communicates directly with both operating and dressing rooms. The floor space is about three-fourths of an acre.

Since their occupation by the medical department all buildings have been reroofed and painted, complete cement

walks have been built and many parts entirely remodeled. The post (Hospital Three)* of which the hospital formed the most important part, also contained as separate organizations a company of instruction and a casual camp.

PATIENTS—The bed capacity of the hospital was 297, with 57.5 square feet of floor space, and 1035 cubic feet of air space per bed. As a rule there were few vacancies. Each ward had attached to it rooms for the sanitary soldiers on duty, and for patients' effects. The number of each bed corresponded with that on a locker in general and ward store-



ONE OF THE CORRIDORS OF HOSPITAL THREE.

rooms, as well as on the ward slip and the cards in the office of the registrar. Incoming patients were examined by the officer-of-the-day as soon as received, the diagnosis was made or confirmed whenever practicable, the diet outlined, and any

*Hospital Three was organized 19th January 1900 from the Supplementary Wards without change of personnel or administration. The Hospital Corps Company of Instruction was founded 23rd May, and the Casual Camp 7th June of the same year.

necessary medication prescribed before the man was sent to his ward. Each patient was seen at least twice daily by his ward surgeon, who was responsible for everything pertaining to his ward. A permanent consulting board, consisting of the commanding officer, the officer-of-the-day, and the ward surgeon was called whenever requested by the latter. The laboratory was well equipped for ordinary clinical work, and the pathologist examined blood, faeces, sputum and urine on application of the ward surgeons. A complete record of treatment and of the more important symptoms was kept and filed



LECTURE AND MESS HALL OF CASUAL CAMP, HOSPITAL THREE.

for reference. Meals for convalescents were served in the main dining hall (figure 3) from four regular diet lists, one of which was entirely in the hands of the ward surgeons.

Patients were classified according to their disease or injury, and as all cases of permanent disability in the Philippines were sent to this hospital, (every one of which was that of a possible future pensioner), the work was of more than ordinary responsibility. Up to the end of April of this year

the hospital had treated over 7000 patients, the most common ailments being tropical diarrhoea, dysentery, typhoid and malarial infections, wounds, disorders of digestion and tuberculosis. One case of pestis bubonica developed in a ward containing fifty-three patients but was not communicated to others.

As many of the patients were convalescents especial effort was made to provide for their entertainment by means of band concerts, phonographic entertainments, drives about the city, river and bay trips on the launch New York, and a well selected library of about seven hundred volumes.



MAIN DINING HALL OF HOSPITAL THREE, SEATING 340.

ADMINISTRATION.—The administration was conducted on a system of divided responsibility, (it might be termed a "block system") as each head of a department was given as complete autonomy as possible without nagging interference so long as his work was efficient and showed steady improvement. The head of a department represented the commanding officer so far as his subordinates were concerned, and was made to feel that a personal interest was taken in his indi-

vidual record and progress. In such a system there is no loss of authority or dignity to the military head, but there is a division of responsibility which is strictly in line with specialized up-to-date "automatic" methods. The man who uses men's heads to advantage is a better administrator than he who uses merely their hands, and most unfortunate is the military command whose head is a slave to detail. Frequent personal inspections, both official and informal, kept the commanding officer, the officers-of-the-day, and the superintendent in close touch with subordinates whose suggestions in regard to their own work were treated with respect and often were of value. It is not what the inspector sees, but what the subordinate thinks he sees, or fears he may see, that gives value to inspections, while judicious approbation is a power in itself. The orders of the post were embodied in a so-called Circular of Information, a copy of which was issued to each man by the executive officer, and he was required to enter new orders whenever issued.

PERSONNEL.—The personnel was officers 6, noncommissioned officers 10, privates 60, native laborers 11, a total of 87. Percentage of personnel to bed capacity 29.28. The duties of the officers were:

1. Commanding officer.
2. Executive Officer, Summary Court, preparation and correction of certificates of disability.
3. Acting ordnance officer, quartermaster and commissary.
4. Two wards and sick calls.
5. Two wards and operating surgeon.
6. Two wards and pathologist.

The noncommissioned officers had the following duties :

1. Superintendent of Hospital.
2. Provost Sergeant.
3. Registrar.
4. Commissary Sergeant.
5. Pharmacist.
6. Quartermaster Sergeant.

7. Chief Clerk.
8. In charge of operating room.
- 9, and 10 Wardmasters.

Had there been four more noncommissioned officers available they also could have been advantageously detailed in charge of wards,

The Superintendent supervised the executive work of all departments, temporarily filled vacancies in emergencies, acted as first sergeant of the detachment, and (under the executive officer) was responsible for its discipline, attention to duty and appearance. In company with the provost sergeant he reported personally to the commanding officer before the officers-of-the-day and the executive. The advisability of having a noncommissioned officer act as superintendent of a three-hundred bed hospital is, I am aware, open to question. Its advantages are that an old well trained noncommissioned officer is in close touch with the men, and can accomplish much in a tactful advisory way. He was never given any authority which would bring him into antagonism with an officer or a contract surgeon. No officer could be spared for this work, and the experiment was a satisfactory one, although I should hesitate to repeat it—so much depending upon the personality of the man.

The Registrar was responsible for records and correspondence, and had six clerks. With the exception of descriptive lists from the company of instruction, or casual camp of the hospital corps, (for which their own immediate commanders were responsible), he personally inspected every paper entering or leaving the office, and if necessary informally returned for correction those from other departments of the hospital with the data for their alteration. No officer was available for this duty.

Space does not permit of extended description, neither are the details of interest, but it may be stated that the division of office work was as follows:

Chief Clerk, assistant to Registrar, (assuming his duties when necessary), the supervision of cross-references, and preparation of papers relating to the detachment of the hospital corps.

Second Clerk, preparation of the report of sick and wounded, register of patients, and the admission of patients.

Third Clerk, certificates of disability and papers relating to oversea transfer of patients.

Fourth Clerk, assistant to second clerk.

Fifth Clerk, letters sent, letters received, notifications and correspondence relative to admission and discharge of patients.

Sixth Clerk, reception of papers, files of orders, copying, and office orderly.

The general orders for the office were, "The greatest vigilance will be practiced to guard against clerical errors. Names will be verified by having the soldier spell them whenever practicable, all routine returns will be carefully compared, and every list of names checked letter by letter. A record of the clerical errors of each man will be kept by the Registrar for the information of the Commanding Officer. Each clerk will attend to such other duties as may be assigned to him. Each paper will bear an approved mark, or the initial of the clerk preparing it, in addition to the check mark of the Registrar. Each and every communication passing through the office will be regarded as confidential, and no information or papers will be given out except on proper authority."

The work of this hospital was done by soldiers of the hospital corps, every position from that of Superintendent being filled by them, and their work was satisfactory. There were no male or female civilians employed in the buildings, but the police of the grounds was done by eleven native laborers. Considering the class of men which is attracted by the opportunities for education and promotion which the hospital corps now offers, it is believed that the efficiency of a detachment is an index to that of its commander.

INSTRUCTION OF HOSPITAL CORPS.—Second only in importance to the treatment of the sick is the instruction of the hospital corps. This was systematically carried on in four directions. First the whole institution was regarded as a school, and each department as has been said was put in charge of a soldier who was held responsible for its efficiency. His orders were written in the plainest language, verbal orders were avoided, and he was encouraged to systematize the work of his department. Subordinates were promoted to more import-

ant positions as rapidly as their progress permitted. The sanitary soldier of the 20th century has so many and such varied duties that it is considered indispensable that he should see service, not only in field and hospital, but in every department of the latter as well. In the field he shares every danger with his brother of the line, but he is of value *only* in direct proportion to the training he has received in the hospital. If in garrison the hospital corps man is regarded as only an 'attendant', an orderly to the sick, or an assistant to a female nurse, the price of the mistake is paid for by an inefficient sanitary service of the zone of fire, for which duty the sanitary soldier exists and in which place he can have no substitute.

All round hospital experience is best gained by rotation in station, and this change was made once a month so that every man might become acquainted with ward service, food preparation and supply, dispensary work, operating service, office duty, care of animals and so forth. This practice involved much labor on the part of the officers of the institution in order to prevent impairment of its professional service, but the final results are believed to have justified it.

The second form of instruction was by means of lectures or more properly informal didactic instruction, supplemented by questions and answers held five times a week. The course was varied from time to time, and those showing sufficient aptitude and proficiency at the bi-monthly examinations were recommended for promotion.

The third line aimed especially at the inculcation of a spirit of military discipline. As no better method of obtaining exact and unquestioning obedience is known than by drill, the attendance of every man was required. In no part of an army is discipline so necessary as among those who attend the wounded under the fire of the enemy, assist in operations where delay means death, or stand sentinel between a contagious disease and a military command.

Finally there was a form of instruction, not very tangible it is true, but still of moment—the formation of an *esprit de*

corps. With this end in view the men were encouraged to organize an association of their own, their barracks were made as comfortable as possible and furnished with numerous periodicals, interest was taken in their base-ball club, and they were made to understand that their detachment as a military organization merited their pride in its efficiency. By these methods soldierly self respect and a healthy moral tone were obtained, so that when the detachment volunteered to a man to nurse plague, and when at another time one of their number* remained by his patient for hours after receiving what he considered a fatal wound, their officers felt well repaid for their work.

CONCLUSION.—The military hospital differs from the civil in almost every particular of patient, administration, and personnel. Its commanding officer possesses greater authority and graver responsibilities than those of a mere medical superintendent. The technical knowledge of decisions regulations and papers, which is required to protect the interests of the government on the one hand and to prevent injustice to the soldier patient on the other, can be learned from neither book nor school. In no country can there be obtained a higher class of purely professional talent than in our own, but those trained in the specialty of military medicine must be provided in time of peace. This is the work which the gentlemen composing the Association of Military Surgeons are doing, and the reward will come not only in the saving of life, and the prevention of suffering, but by assistance of no mean value when the time comes for the final object for which all armies exist—the test of battle.

*Private Archibald D. Wilson, H. C.

NATIVE TROOPS FOR OUR COLONIAL POSSESSIONS.¹

By MAJOR LOUIS LIVINGSTON SEAMAN,

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SURGEON FIRST UNITED STATES VOLUNTEER ENGINEERS.

THE TIME is at hand for the authorities of the United States to decide a military question of the gravest importance, namely, whether our island possessions in the tropics shall be garrisoned by troops sent from this country, or whether native troops shall be recruited for this purpose. Involved in this question are considerations of climate and subsistence; of vast expenses for transportation of men and food; of expenditures for wages and future pensions; of intricate hospital arrangements involving elaborate establishments, mutually dependent but thousands of miles apart. For the solution of a similar problem in China, the recent experiences of Great Britain at Wei Hai Wei are luminous in purpose and results, and most timely for immediate application to this country's needs, especially in the Philippines. It is worth while to study with the utmost care what England has done with her native battalion at Wei Hai Wei.

Forty miles to the eastward of Cheefoo, where in the year 1895, with the guns of the Russian fleet clearing for action, the treaty of Shimonoseki was ratified by China and Japan, lies the harbor of Wei Hai Wei. It is a bay formed by a sharp break in the rugged coast line, and is protected at its entrance by the island of Liu Kung Toa. Nature has been liberal to China in the matter of shelters to commerce, robbing the eastern shores of the Pacific that she might furnish the western with magnificent harbors and bays. Of these Wei Hai

¹ Read at the ninth annual meeting of the Association at the Academy of Medicine, New York, June, 1900, and also published in the *North American Review*.

Wei takes easily primary rank, with its capacious, deep, mud-bottomed harbor, and its natural defences.

Wei Hai Wei (pronounced as though it were written Way High Way) was founded in the reign of the Emperor Hung Wu, of the last (Ming) dynasty, about A. D. 1399. The third syllable—for there are three syllables rather than three words—means a walled military post; the first, though homophonous, means to awe, or, as we would say, to over-awe; the middle member of the name is the word for sea. Thus Wei Hai Wei is the "Terror of the Sea," so called because it was used as a base from which to subdue the pirates that infested the neighboring seas.

In the year 1883, the first steps were taken to fortify Wei Hai Wei, as a base for military operations; but the war with the French in 1894 led to the abandonment of the work before much had been accomplished. When peace came, the interrupted activity was renewed, and the rapidly growing northern ocean squadron of the Chinese navy found here its summer rendezvous, the harbor at Port Arthur, or Lu Shon Kon, as the Chinese call it, being far too small to shelter more than a few ships at one time. Later, two lighthouses were erected. Forts were built under German superintendence and supplied with guns by Krupp, whose agent, the late General Schnell, was instructor in gunnery in the Chinese garrison. Money was spent liberally, and excellent work was done in the way of fortifying the place, for the Mandarins got their "squeeze" not by "jerry building," but by purchasing less than was provided for, and by drawing money for the expense of battalions which never existed. And when they did go in for "jerry building," their methods were radical. The presiding genius of the day, Li Hung Chang, found on his last inspection, made just before the Japanese sank the "Kow Shing" and so opened the war, that a fort on the far east end of the bay had been built of wood. Mighty was the wrath of the great Li, and frightful the consternation of the two generals responsible for the fraud, fellow provincials and proteges of Li himself. They were instructed to rebuild at once, and with stone.

But whence the funds? These were found in a way that was simplicity itself. A battalion was estimated for, and although it never existed, save on paper, money was drawn for its maintenance. Stone was obtained speedily from the wonderful and inexhaustible granite quarries of Shih Tao, in the Shan Tung promontory and there it lies today, for the Japanese war put a stop to further fortifications. And when the Chinese Government recently turned the place over to the British, the local authorities had no knowledge of the existence of this material which was boldly claimed by a disgraced general.

On November 21, 1894, Port Arthur fell into the hands of the Japanese, who shortly began to turn their attention to Wei Hai Wei. On the 20th of January following, twenty-five thousand men were landed on the sheltered shore of Yung Cheng Bay under cover of the guns of the Japanese fleet. From that place to Wei Hai Wei, a march of more than forty miles was necessary over a country innocent of a road wider than a pack mule track, and on February 12, 1895, Wei Hai Wei was evacuated by the Chinese. Of their fleet, some were sunk and some captured. Admiral Ting, a brave officer, willing to fight, but under orders not to leave the harbor, chagrined and heart-broken, swallowed opium after signing articles of capitulation. The country around was occupied speedily and effectually by the Japanese. The treaty of Shimoseki provided that Wei Hai Wei should remain in the hands of the Japanese until certain stipulations should be carried out, and for nearly four years Japan maintained a large garrison there, but on July 24, 1898, the Japanese flag disappeared from the harbor. For a brief time the Chinese emblem displayed its dragon swallowing the sun, shortly to find a companion in the Union Jack, and finally to disappear a few months later; leaving the British nominally, as they had been actually, in control of Wei Hai Wei, their new "sphere of influence."

It is on these historic shores that the experiment of transforming the Chinaman into a modern fighting machine has been successfully made by the newcomers, while the military

experts of the world are watching the results with increasing interest. And since the policy of our own country to retain permanent possession of our new insular colonies now seems established, we, too, should be especially interested in the experiment from a military as well as an economic point of view. Wherever the flag of England floats, there you will find her defenses maintained by native guardians. The flower of her army is not consumed in colonial garrisons. In India, the Gurkhas and Sikhs, officered by Englishmen, form her military reliance. In West Africa the Houssas are her defenders. In Egypt the Baggaras, transformed by the skill of Kitchener, rout the forces of the Mahdi. In the Windward and Leeward Islands and Jamaica, native regiments (blacks) are employed exclusively; so, too, in Australia and Canada, her soldiers are mostly native born, and in South Africa, until the outbreak of the present war, Zulus, supplemented by a small contingent of English troops, maintained her defense and security. Where, indeed, would England be to-day were it not for these native forces guarding her colonial empire, while her own soldiers are engaged in the Transvaal hostilities? Quick in her perception of this great advantage, she no sooner got possession of her new sphere in China than she at once set about organizing a means of defense by utilizing the material at hand, knowing that, if successful, she could at once eliminate two of the greatest problems besetting an army on a foreign shore, that of acclimization, and of subsistence, with the attendant dangers of climatic and epidemic diseases.

It was my good fortune, on a recent visit to Wei Hai Wei, to meet Colonel C. H. Bower, R. A.—to whose genius has been intrusted the serious experiment of transforming native Chinese from mild-mannered Coolies to modern soldiers—to witness many of their drills, and to get from Colonel Bower's own lips his account of the work. He approached the task with many misgivings; but after six months of patient work his views changed radically. The First Battalion, Chinese Regiment, recruited during the past year, numbered at the time of my visit three hundred and sixty men, all from the Shan Tung Province, where the finest specimens of physical devel-

opment of China are to be found. These men are enlisted for three years, under the regular provisions of the British Army Act, for service in any part of the world. They have been selected with the greatest care. The average height is five feet eight inches, with a chest development of thirty-eight inches, a standard higher than that of the regular British army to-day. Three companies of one hundred and twenty men each were well advanced in training. The organization of the company in detail is similar to that in the United States Army. All the commissioned officers are British, but the non-commissioned staff, with the exception of one sergeant-major, one color-sergeant, one orderly-room clerk and one armor-sergeant, are Chinese.

It is certainly wonderful what a few months' hard work accomplished in "licking the 'rookies' into shape." Colonel Bower assured me that while originally he was far from being impressed with the idea of making soldiers of the Chinese—indeed he was decidedly prejudiced against even such an attempt—experience had convinced him of his error, and that he was now becoming an optimist. The initial processes of drilling were tedious and required much patience on the part of the drill-master; but the men soon learned to respect their superiors and became attached personally to them; and the officers, having once gained the confidence of the men, could do almost anything with them. Discipline was maintained with but little use of the guard-room, and drunkenness was unknown.

These Chinese recruits are remarkably respectful, orderly, docile and learn their tactics well; but the greatest patience has to be exercised with them until they fully understand their positions and are brought to a realization of their responsibilities, of which, in their early days, they seem to have no understanding. For more than six thousand years the Chinaman has followed his own method, and it is difficult to make him realize the importance of precision in military affairs. For instance, when a leave of absence for seventy-two hours is given to him, he will return perhaps in ninety-six, thinking it is all right. What's the difference? He cannot be made

to see it; "came back all right; three days all the same four, so long as he did come back." But when put in the guard-room for a week and made to do extra labor, his sleeping sense of duty is awakened and he does not repeat the offense. Notwithstanding that the drills at Wei Hai Wei have been very severe, desertions were unknown, although opportunity could be found easily, as the British concession or sphere of influence extends only ten miles inland. The uniform of the troops is rather picturesque: straw hats in the extreme heat of summer, to be replaced by turbans in winter; khaki blouses and breeches for the summer, to be exchanged for rough Irish frieze in winter; red cummerbunds, and putties instead of leggings, with the regular artillery boot of the British Army.

Colonel Bower was especially enthusiastic over the results of his men's musketry practice at the rifle butts. At the time of my visit they had been trained for short range work only, one, two, and three hundred yards; but their scores had been exceedingly gratifying, better even than those of the average British soldier after an equal amount of practice, to the great astonishment of all the officers of the regiment.

The cost of these troops to the British Government is another surprise. Their ration consists of one catty of rice (1.33 pounds), one-third catty of flour daily, and one pound of meat once a week. The cost of this to the British Government is \$2.15. Mexican, a month; the soldiers' pay is \$8.00, Mexican, a month, making the entire cost to the Government for the soldier and his subsistence \$10.15, Mexican, or \$5.00 gold, a month. All vegetables and luxuries are purchased by the soldier at his own expense. The health of the men was excellent. Since the organization of the regiment there had not been one death or a serious case of intestinal disease, although the period has included the most inclement season of the year. Colonel Bower was convinced that with a year or two more of training, his men would be equal to any soldiers in the world.

At the time of my visit, the battalion had its first experience in fighting fire. A conflagration occurred in the old city.

On such occasions it is the custom of the natives to sit by supinely, watching the progress of the flames, even though a whole city may be in a blaze, or to indulge in looting. But the English officers were on the scene quickly with the Chinese battalion, a fire-brigade was organized promptly, water was passed up in buckets and the fire put under control, while the populace stood by and marvelled.

Within a year of their enlistment, these troops successfully stood the crucial test of leading a charge. In a sharp action with a vastly superior force of Boxers, the same who are now menacing the safety of the Chinese Empire in the Provinces of Shan Tung and Pi Chi Li, and about Tien-Tsin and the Imperial City, Peking, the Chinese Battalion, with their British officers, quickly routed the enemy, killing sixty and capturing a large quantity of arms. Their own casualties amounted to only two, both British officers, who were wounded. Thus they demonstrated beyond cavil their fidelity and loyalty to the new flag they had sworn to uphold, even when their opponents were their own countrymen.

Hitherto, we have been accustomed to laugh at the soldiery of China; but, indeed the fact that her soldiery is a laughing stock on account of lack of training and bad generalship, proves nothing against the Chinaman's courage. Fortunately there can be no question of his innate bravery. For a consideration, or when convinced that he is right, he puts the fear of death entirely out of his mind. Like the negro, the Egyptian or the Malay, all the Chinaman wants is the inspiration and leadership of resolute white officers. Conspicuous examples of their personal bravery are not lacking in the official reports of our own officers serving in the Philippines, notably those of Lieutenant Batson, of Major Bell, of Captain Sawtelle of General McArthur's staff, of Colonel Powell and Captain Durfee of the Seventeenth Infantry, and of Major Shields, Surgeon of the California Volunteers. My own observations on the firing line confirm these opinions. The Chinese drivers or litter bearers were as absolutely unconcerned under fire as though out in a snow-storm, and they obeyed their orders implicitly.

An incident illustrating the bravery of the coolie is narrated by Major Fitzgerald. It occurred at the battle of Malolos, in Luzon. An American soldier had fallen at the front; two coolies had rushed forward with their litter, consisting of a little hammock swung from a pole, and were bringing the man back to the dressing station, when a bullet pierced the thigh of one of the litter-bearers. He continued on, however, as though nothing had happened, until he deposited his charge beside the improvised operating table. Not until some time later was it found that the coolie was wounded severely and suffering intense pain. He endured it all with the patience and stoicism of his race, and expressed surprise that attention should be bestowed upon him at all; he had expected to be left by the wayside.

That the yellow and black races make excellent fighting material, when properly officered by whites, has been proved conclusively in innumerable instances. In our own army at San Juan Hill, the Twenty-fourth and Twenty-fifth United States Infantry and Tenth Cavalry, negro troops, led by their gallant white American officers, did as effective work as any men, regulars or volunteers, on the field. Nor did their heroism cease there. Later, when that more dreaded enemy, yellow fever appeared in every camp, and when volunteers were called for to nurse the sick and dying and to bury the dead, it was these men of the negro regiments who responded to the call, notwithstanding that their numbers had been terribly reduced in the battle only a few days before, and the fatal pestilence was raging in their own ranks. One hundred and twelve of these martyrs succumbed to the disease, but they quavered not in the hour of danger.

Nor is this record for fearlessness in the so-called inferior races confined to our own army. What did Kitchener do with the Egyptian peasants who for centuries had been regarded as menials and cowards? By tactics similar to those now being followed by Colonel Bower with the Chinese at Wei Hai Wei, he transformed them into cavalrymen, who not only successfully resisted but charged and broke the bloodthirsty

followers of the Mahdi and defeated them with terrible slaughter. Fifteen years ago the idea of making a soldier of an Egyptian would have been ridiculed as a practical joke by military men. Training and the inspiration of leadership won the victories, and the Egyptian soldier of to-day has his place in history.

The experience of "Chinese" Gordon at the taking of the Taku forts in 1860 is eloquent in its showing of the individual bravery of the Chinaman. Large numbers of coolies were pressed into his service as cooks, litter-bearers and for transportation purposes. Arriving at the moats surrounding the forts, these slaves of duty seized the scaling ladders, rushed into the water nearly neck-deep, and in the face of a galling rifle and artillery fire placed the ladders on their shoulders from man to man, thus forming a continuous bridge supported by human pillars, and let the British army walk over their heads to the other side of the moat. Then, rushing from the water with their ladders, they ran to the walls of the fortresses, and were the first to scale their ramparts. Thus was courage inspired, and thus did it become contagious, even as panic and disaster would have resulted had the leadership failed.

Nor has Spain been without experience in the use of native troops in her colonies, in the very place where this urgent military question must be met and solved by the United States, namely in the Philippines, upon which Spain placed strong reliance, was her native Filipino troops, of whom, when Manila fell, she had about five thousand. They were among her best disciplined and bravest troops, familiar with the country, its warfare, its dangers and its ambuscades, in excellent health and thoroughly acclimated, speaking the language of the country, free from danger of tropical diseases, and subsisting on native foods. Our failure to secure them for service under the American flag was promptly taken advantage of by the wily Aguinaldo, who, upon condition of their swearing fealty to him and entering his army, promised them immunity from their countrymen and reward for their service. It was

only a short time before the entire force was under his control, almost every soldier being made an officer in the Filipino ranks. It was in this way that Aguinaldo was enabled to create the disciplined array that was destined to cope with our army of over fifty thousand men.

In view of our failure to secure the trained Spanish-Filipino soldiers, and considering the suspicion that exists, and will probably continue to exist, toward us among the natives of the islands, the experiment of Great Britain with the Chinese Battalion at Wei Hai Wei is of signal concern to the United States. In our Philippine possessions there are already more than one hundred thousand Chinese, who form by far the most industrious class of the inhabitants. The Chinese mestizo (half Chinese and half Filipino) is acknowledged to be superior to the Eurasian, or to the mestizos of Oriental cross, Japanese, Hindoo or Bornese. Many of them are wealthy bankers and merchants. Others are engaged as compradors and clerks, banking houses employing them almost to the exclusion of other nationalities, on account of their quick wit, sterling honesty, industry and individual merit. As in the Hawaiian Islands, they form the most valuable element of the population. The Chinese-Hawaiian half-caste is the keenest business man and the most industrious citizen to be found in those islands. The exclusion of the Chinese laborer in that land will do inestimable damage in retarding industrial and commercial development. Despite his fanaticism when directed by ignorant rulers, he has shown his superiority over other Orientals in his untiring industry, his domesticity, and his honesty.

In the large foreign hongs of China and Japan he is the trusted employee in places requiring responsibility. When put in competition with the Bornese, the Filipino, the Singapore, the Hawaiian, the Japanese or the Indian, he invariably wins, as may be seen by his rise from poverty to wealth and influence in the cities of Singapore, Calcutta, Sandakan, Manila, Honolulu or Yokahama. It is time the world recognized that in the great race of civilization, and the greater

race for the survival of the fittest, the nation that has preserved the integrity of its government for over six thousand years, that has witnessed the rise and fall of the civilization of Chaldea, Egypt, Greece and Rome; that can claim the discovery of the compass, of gunpowder, the game of chess, and the printing press, is more to be feared for its virtues than its vices. The presence of the Chinaman in the Philippines, as in the Hawaiian Islands, will do more to promote the industrial development of these colonies than any other single factor. His exclusion was a diplomatic blunder to be rated with our failure to secure the army of Filipinos trained by Spain, and the discharge of the Civil Guard of Manila, five hundred strong, all of whom immediately entered the service of Aguinaldo; and the irrational rationing of our troops, which did, and is still doing, so much to invalid and decimate our army. To attribute to climate the diseases of the tropics is an error due to ignorance and custom. The vast majority of ailments credited to climate have their origin in the use of improper foods, overfeeding, or the abuse of stimulents.

During the past two years, it has been my misfortune to see two great armies—one in our own southern country, Cuba and Porto Rico, and one in the Philipine Islands—largely invalidated, through culpable ignorance or neglect, by improperly subsisting the troops. To the eternal disgrace of our medical and commissary departments it will be remembered that, when entire regiments were suffering from stomach and intestinal catarrhs, from diarrhoea ailments (and I have seen more than seventy-five per cent. of an entire command in this condition at one time), they were subsisted on a ration of rich meats, pork and beans, tomatoes and other foods that aggravated the diseases, crowded the hospital tents, and left the men weak and emaciated, so that their return to health was a prolonged struggle. Taps and the last volley were often the only reward many a poor soldier received for his patriotism.

As represented in caloric units, the ration supplied to the American soldier in tropical lands amounted to thirty-eight hundred units, while that given to an English prize-fighter

in a temperate zone, when training for the ring, amounts to only twenty-eight hundred caloric units. It is an old saying that "it is the ration that wins the battle." As furnished to the soldier, the ration was an excellent winter food, rich in elements requisite for respiration under a low temperature; but for a tropical land, the enormous excess of carbon furnished by it to the lungs, over and above that which they could dispose of, imposed upon the liver and kidneys additional duties of elimination, producing congestions, fermentation and catarrhs, dyspepsia and lithæmia, glycosuria and phosphaturia, interfering with metabolism, and creating conditions favorable to bacteriological development, together with almost the entire train of diseases which have crowded our army hospitals. In phosphaturia, especially, the nervous system is deprived of the salts necessary for its proper function, which privation not infrequently results in mental disturbances that may end in suicide or insanity. How little the heat is directly responsible for these cases may be inferred from the extreme rarity of sunstroke in the tropics.

Dr. John Ordonaux, Emeritus Professor of Medical Jurisprudence in the College of Physicians and Surgeons, served with distinction thirty-five years ago in our War of the Rebellion as a volunteer surgeon. It was at that time that the famous saying, "Beans killed more than bullets," arose. In round numbers the mortality from bullets, directly and indirectly, was one hundred thousand, while that from disease was five hundred thousand, or five to one. Commenting on this fact thirty-seven years ago, "that the ration served our troops in the South was the same in winter as in summer," Dr. Ordonaux said:

"By proper disposition of his diet, man lives as healthfully under the Equator as under the Pole. The East Indian with his rice and yams, and the Esquimo with his seal blubber and putrid fish, are both healthy enough in their respective climates, but let them once change residences without changing their diet, and what would be the consequence? The Esquimo would be attacked with putrid fever, and the East Indian would die of inanition.

"We perceive from this the absolute necessity of modifying all forms of

diet in such a way as to accommodate them to the physiological requirements of varying seasons. For habit is not acquired as against laws of chemical combination, and no man can become habituated to doing that with impunity, which, being a violation of the physiological laws of his system, is, by its frequent admonitions of pain, notifying him of the evils about to overtake him.

"As the ration bill now stands, it presents us with too concentrated a form of diet for continued use. It abounds in fibrine, gluten, and fat, with out, however, a sufficiency in starch, mucilage, gelatin, and acids. Aromatic herbs and spices, without which health cannot for any length of time be preserved, particularly in hot climates or seasons, are entirely omitted, while fat pork, an article contra indicated in summer both by the state of the appetite and the physiological necessities of the system, stands as a sheet anchor of its animal food."

And of what avail was this prophetic warning? The ration table of the United States Army in the Spanish-American War was substantially the same as that during the Rebellion.

From the dawn of history experience has shown that, in time of war, disease was a far more deadly foe to an army than the bullets of an enemy. In the War of the Crimea the French lost in killed 21,000, and from disease 100,000, or about one from bullets and wounds to five from disease. The English losses in that dreadful campaign ran a little higher, the proportion between fatalities and bullets and wounds and that from disease being one to six.

In our Civil War, about the same proportions were maintained, one to five. In round numbers, 100,000 men fell on the field or died from wounds, and 500,000 perished in hospital wards from the more fatal enemy—disease.

But it has been reserved for the Spanish-American War to cause a blush of shame and indignation at the apathy and stupidity which has permitted preventable diseases to play such havoc with the army. In the campaign, the actual hostilities of which lasted from July 1st to August 12th, about six weeks, the mortality from bullets and wounds amounted to 268, while that from disease reached the appalling number of 3,862, or about fourteen to one. With proper subsistence and sanitation these proportions, for such a short service, should have been reversed.

With our military hospitals in the Philippines still crowded, despite the constant relief of their wards by shiploads returning on transports, and the decimating policy of irrational subsisting the troops still in force, it behooves the United States to follow the example of England at the earliest possible moment and to resort to the only reasonable course left open for the maintenance of her army in the Orient, namely the utilization of native troops. Most authorities agree that it will require a garrison of at least forty thousand men to maintain order in the Philipines even after peace is declared, but I coincide with General Lawton, who told me that he thought it would require many more than that number to bring order out of chaos, to establish law in the various provinces and to maintain its complete supremacy.

The United States now has twenty-five regiments of volunteers in the Philippines, whose term of service will expire on June 30, 1901. Most of the enlisted men will wish to return at the expiration of that time, some sooner, while some will be willing to serve longer. A majority of the commissioned officers would welcome the opportunity to retain their places permanently. I would suggest that, at the earliest possible date, such of the enlisted men, not exceeding one-third, as desire their discharge on account of sickness or for other causes be allowed to leave the service. Then, from the third battalions of each regiment, let all the enlisted men, excepting a few non-commissioned officers in each company, be transferred to the other two battalions, thus filling them to their full strength. Enlist one battalion of Chinese, or of native friendly Filipinos (Macabees or Ilocanos), to each regiment making the composition of each regiment two battalions of white and one battalion of native troops, with white officers throughout, and a certain proportion of white non-commissioned officers in each native company. At such time as the authorities deem advisable, transform a second battalion of white to native troops in a similar manner. Then, when the proper time arrives, and the success of the move is demonstrated, transform the third battalion of each regiment, and, as circumstances

may justify, replace such of the white non-commissioned officers as may seem best for the interests of the service by native non-commissioned officers, but keep white commissioned officers first, last and all the time.

Published statistics recently furnished by Congress state that the cost of the army in the Philippines in the last year was about \$150,000,000. It is easily within reason to declare that each fighting man costs the Government more than one thousand dollars, gold, a year, for pay, subsistence, cost of transportation service and medical attendance, without any calculation for his future pension claim. The pay of the American soldier in the Philippines is sixteen dollars, gold, a month. His ration costs far more, when the enormous wastage and cost of transportation is calculated. It is no uncommon incident for entire cargoes of beef to be lost in transportation across the Pacific. I know of three such instances last summer. And in calculating the cost of the American soldier no mention has been made of the expenses of hospitals with their medical staffs, nurses, orderlies, helpers, etc., all of which add enormously to the expenditure.

The native Chinaman or Filipino can be enlisted in unlimited numbers for ten dollars a month, and can be subsisted for four dollars more. Additional expenditures for transportation, etc., might cost two dollars more, making a total of sixteen dollars a month, or not more than two hundred dollars, gold, a year, or about one-fifth of our present expenditure, and with no danger from an everlasting pension claim in the future.

In an interview with Li Hung Chang, at his palace in Peking, some months prior to the outbreak of hostilities in China, he assured me that China would interpose no objection to the enlistment of her subjects in the American army. But if, in the present crisis, such recruits are not considered desirable, there are many friendly Filipinos to be substituted. Great Britain recruits her ranks from various tribes or castes in India, and tribal hatreds are often utilized in the pacification of outbreaks among the natives. The same policy can be advantageously followed by us in the Philippines, where the

friendly tribes of Ilocanos and Macabees are the implacable foes of the rebellious Tagals.

England has a great advantage over the United States in colonial government and in colonial military affairs, in that there is not always a home party in opposition wanting to apply the Constitution to the natives, telling the discontents that as soon as their party gets control all complaints and wrongs will be rectified. The home Government acts as a unit and with a consistency that challenges the admiration of the world.

It remains to be seen whether by the liberal utilization of native troops, we shall save the flower of our army for service at home, and preserve it from degrading conditions that, alas! too often are brought to this country by returning troops. And it also remains to be seen whether the country shall be spared the depletion of its Treasury through extravagant expenditures caused by improvident military administration leading to enormous pension claims. The Spanish war has resulted in the filing of over twenty-five thousand of these claims already. Who can say what the number will be when those resulting from the Philippines campaign are recorded?



SOME SUGGESTIONS WITH RESPECT TO THE
CHARACTER AND METHOD OF CARRIAGE
OF MEDICINES INTENDED FOR USE
IN FIELD HOSPITALS.

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WHILE in charge of the exhibit of the Medical Department at the Pan-American Exposition, the writer was impressed, as a result of a careful study of the new field hospital equipment, as authorized in the Manual for the Medical Department, 1901, with certain defects in the existing methods of supplying and transporting medicines for field use, which, though serious, nevertheless, appeared capable of being readily corrected by simple measures.

The pills and tablets supplied to the Medical Department by manufacturing pharmacists, even when containing equal quantities of the same drugs, vary greatly from each other in size, form and appearance. Each manufacturer apparently desires to preserve the individuality of his product by giving it special characteristics. However advantageous this practice may be to them from a commercial standpoint, it is highly undesirable so far as the Medical Department of the army is concerned, and especially so for conditions of field service. In the field medicine chests, each container is supposed to hold a definite and fixed number of doses of medicine; and uniformity in this respect is as essential as uniformity in the allowance and supply of ammunition for large and small ordnance, to which this condition is obviously comparable. Under present conditions, a can intended to hold 1000 tablets, each of which

is a single ordinary dose, may, if replenished from a supply of medicine purchased under contract from another pharmaceutical firm, contain as many as 1300 tablets or doses, or as few as 700 tablets or doses—thus causing a variation of as much as 60 per cent. in the amount of medicine available for use in the treatment of the sick. Obviously, a supply of medicines officially intended to meet the needs of a body of troops for the period of three months may thus suffice for only about two-thirds that time, or, on the other hand, may be sufficient for an equal number of men for four months. Hence, under present conditions, the medical officer never can have even an approximate idea of the number of doses of any given kind of medicine contained in his field chests.

To remedy this condition, it was lately recommended by the writer that the authorities of the Medical Department confer with several of the more prominent manufacturing pharmaceutical firms, for the purpose of definitely establishing an "army standard" to govern the form and sizes of tablets and pills to be purchased for future use in that department. These standard sizes should be stipulated in the making of future contracts for medicines, and any supplies furnished, not in accordance with these specifications, should be rejected. It is believed that three sizes of tablet will be sufficient in variety for this purpose. The small size should include those drugs in which the ordinary dose occupies a small space, such as morphine, strychnine, digitalis, podophyllin, etc. The medium size tablet should be employed for those drugs in which the ordinary dose varies from 200 to 300 milligrams, such as salol, phenacetin, quinine, Dover's powder, chloral, etc. The large size tablet should include the few drugs at present provided in large tablets, as seen in the linimentum rubefaciens tablet, the antiseptic tablet, the sodium carbonate tablet, etc. If necessary, the large tablet last mentioned might safely be omitted and these drugs put up in the 300 milligram size tablet. The various size tablets should be multiples of each other, so that—for instance—four small tablets should occupy in bulk as nearly as possible the same space as a single tablet of the next larger size.

The same principles should also apply to all hypodermic tablets, the size of which should depend upon the diameter of the tablet tubes carried in the standard hypodermic cases supplied. At present, some of the hypodermic tablets supplied by certain dealers are too large to go in the small tubes contained in the hypodermic cases issued by the Department, and hence bottled supplies of such tablets are not available for the replenishment of empty tubes. Further, the small glass tubes of hypodermic tablets furnished by different manufacturers have no standard caliber, and frequently these tubes are so large that they cannot be carried in the standard hypodermic cases, when the tubes originally furnished with the latter are empty, lost or broken. It would thus seem as if the question of instituting standard sizes for medicine tablets, both those for ordinary use and for hypodermatic medication, is worthy of careful consideration.

The present methods of packing medicines in bulk for field use, as in the reserve supply of medicines authorized for the brigade field hospital, together with the character of the containers in which such medicines have heretofore been supplied by the manufacturers, are open to serious objections—by reason of the excessive time and labor required in packing and unpacking, the great liability of breakage, the necessity of always having at hand some packing material, as grass, leaves, hay or excelsior, the difficulty of securing any given article from a packed box or chest, and, finally, of the greatest importance under field conditions, the excessive amount of transportation required for its carriage as compared with the quantity of medicine actually transported.

The allowance of drugs, medicines, and antiseptics for the model brigade field hospital, which was exhibited by the Medical Department at the Pan-American Exposition, were received from the supply depot contained in fifteen (15) old style food chests, besides which there were several smaller boxes containing alcohol and stimulants. The bottles were packed in sawdust, paper, excelsior and other material to prevent breakage; examination of the bottles showing them to

have been supplied in nearly one-hundred different varieties, shapes and sizes. The chests, uncrated, had an average weight of about 170 lbs. each—or 2,550 lbs. for the fifteen chests and a total weight for the chests and boxes of about 3,000 lbs. As a result of careful examination and estimation of the cubic space actually occupied by the drugs, medicines and antiseptics contained in these chests and boxes, the writer was convinced that an improved method of packing would permit the carriage of these articles in six (6) chests, probably weighing altogether not to exceed 1,100 lbs.; thus rendering unnecessary the transportation of nine (9) chests and several smaller boxes, and reducing the weight to be carried with the brigade hospital by about one (1) ton—or what would be four-fifths of a wagon-load for four mules under the most ordinary conditions.

To accomplish this result, the writer recommended that all bottles, packages and containers in which medicines and drugs, either solid or liquid, are supplied by pharmacists in filling army contracts, should, in the future, be required to conform to fixed standards in respect to size and shape; these standard shapes and sizes to be specified in all contracts made by purchasing officers, and medicines not contained in such bottles to be rejected by medical purveyors except under stress of great emergency. These standard bottles should be square in horizontal section with slightly rounded corners, and should have short necks with wide mouths. The bottles should be of but two sizes in horizontal section, the larger size being 4 inches square at the base and the smaller size being 2 inches square at the base. Both these sizes of bottle should have a total height of 6 inches; the height to the shoulder being 5 inches and the neck of the bottle having a height of 1 inch. The larger size bottle of these dimensions holds one liter, while the smaller size bottle holds 250 cubic centimeters. The corks of these bottles should be seated flush with the top of the neck, for the greater economy of space in packing. If desired, a third size bottle may be employed; this being 2 inches square in horizontal section $2\frac{1}{2}$ inches high to the shoulder, and 3 inches high over all. One large bottle thus occupies the cubic space required

by 4 small bottles ; or if it be thought desirable to use a certain number of smaller size containers, the large bottle would occupy the cubic space required by 8 of these smallest bottles.

The large bottles, as supplied by the contracting pharmacists, should be packed as follows: A layer of paraffine paper over the glass and label ; then a protective box or covering of corrugated card-board having a thickness of one-fourth inch and forming a rectangular package ; then an outer labeled covering of stout glazed paper. The smaller bottles are packed with a layer of paraffine paper next the glass and then a protective covering of corrugated card-board one-eighth of an inch thick over all. Four of these smaller bottles—or 8 of the smallest size bottles, if the latter are used—are wrapped together in stout glazed paper ; thus forming a package of the same size as that containing a single large bottle. A “package unit” of definite size and shape is thus created, and all such packages, whether containing large or small bottles, are interchangeable.

For the carriage in the field of drugs contained in such “package units”, stout chests should be provided, similar in character and construction to the old pattern hospital food and mess chests. These chests should preferably be of such a size as to be readily handled, and capable, in emergency, of transportation on mule-back. Their weight should be such that two such chests will form a full back-load for a mule, one chest being slung on each side of the pack-saddle. Such chests should have an inside width of 4 “package units,” or 18 inches. The inside length should be equal to 6 “package units”, which, together with the thickness of a single stout transverse partition, gives a total inside length of 28 inches. Each layer in the chest thus contains 24 “package units”, divided transversely by a partition which prevents movement of these packages when a chest is partially emptied of its contents. Each chest should contain three such layers of “package units”, the two upper layers being each contained in a stout tray, divided transversely by a partition. As each layer of “package units” is $6\frac{1}{2}$ inches high, the inside height of the chest, in-

cluding the thickness of the two tray-bottoms, would be $21\frac{1}{2}$ inches. Each chest would thus contain 72 "package units"; containing a maximum of 72 bottles, of one liter capacity each, 288 bottles of 250 cubic centimeters capacity each, 576 bottles of about 115 cubic centimeters capacity each—or such combination of these different sized bottles as might be desirable. The six chests proposed would thus contain 432 bottles of one liter capacity each, or 1728 bottles of 250 cubic centimeters capacity each, which it is believed would contain the entire reserve supply of medicines in bulk as now authorized for the brigade field hospital. Such chests would probably weigh in the neighborhood of from 125 to 135 pounds each. If desired, the chests could be made somewhat larger, say having a length of 7 "package units", a width of 5 such units and a height of 3 units. Such chests, however, would require wheel transportation and would not be as suitable for field conditions, under all circumstances, as the somewhat smaller chests recommended.

In packing the medicines, drugs or supplies to be contained in these chests, the "package units" should be arranged alphabetically according to their contents, beginning with the letter "A" in the top tray of chest No. 1—so that the position of any article desired may be at once located and the latter is made readily accessible by merely opening a chest and perhaps lifting out a tray. Under present conditions, even if it is known in which box a desired article is contained, it is frequently necessary to remove nearly or quite all the bottles and excelsior or other packing material from the box before the special bottle or medicines desired can be secured—this being accompanied with a great and unnecessary expenditure of time and labor and great liability to breakage. Ordinary boxes also soon go to pieces under the rough handling necessary in packing and unpacking.

With a method of packing as above proposed, it is obvious that the number of partitions required are reduced to a minimum, space is economized and at the same time the contents of the chest are perfectly protected against injury and breakage.

Any vacant spaces caused by the removal of bottles from various compartments may be filled by corresponding "package units" taken from another compartment—as from one of those in an upper tray—so that movement of contents, with resulting breakage, is readily rendered impossible during transportation, even if the chest has been emptied of as much as five-sixths of its maximum contents. If new medicines and supplies are sent out to replenish the brigade hospital reserve chests, these—if contained in the standard bottles and packages already proposed—may be dropped into their proper places in the chests without difficulty or delay, the necessity of breaking up any original packages or the use of packing material. Medical supplies issued for use in posts, if contained in these standard size packages, could thus be taken directly from the shelves of the dispensary or store room and packed in a few minutes in these standard size chests for transportation with a command about to take the field. Any desired assortment or quantity of drugs, in excess of the official allowance contained in the regimental medical chest, could thus be carried into the field with the minimum of space, weight and liability to breakage. It is obvious that liquids can be carried as readily as solids by this method of packing. Another advantage is that bottles which have been emptied of their contents may then be used for dispensing medicines in solution, and until they are required for this purpose they are merely replaced in their original cardboard packages and carried along in the chest until needed. Medical accessories, such as spare corks, plasters, tablet envelopes, etc., should also be put up in packages of the same size and shape as has been proposed for bottled articles so that their transportation and packing would be facilitated. All articles of a medical character would thus be supplied in packages of a standard shape and size.

It would seem that some method is much to be desired by which medicines and other articles which must be supplied in bulk may be carried in the field with greater safety and with less weight and bulk than is possible under present conditions of issue and carriage. It is believed that this object is best accomplished by the simple method above proposed, which, as has been shown, reduces the amount of material to be transported with each brigade hospital unit by nearly a wagon-load.

REGULATIONS FOR THE GUIDANCE OF SURGEONS
AND POST SURGEONS IN THE MEDICAL
EXAMINATION OF RECRUITS FOR
THE NATIONAL GUARD.

By BRIGADIER GENERAL J. FRANCIS CALEF,
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SURGEON GENERAL OF CONNECTICUT.

DURING the last two years, I have had at least a hundred calls for these regulations, prepared for the examination of recruits in the Connecticut National Guard, with which I was unable to comply, as they were published by the State. In the belief then that they may be useful to the medical officers of other states, they are submitted to the Association of Military Surgeons.

GENERAL INSTRUCTIONS TO EXAMINING SURGEONS.

The age of recruits must be between 18 and 45 years; musicians, between 16 and 50 years.

The height of recruits, in stocking feet, must not be less than 64 inches*; musicians, 63 inches. The relation of weight and chest measurements to heights should not be less than in the table given below. In well-built men the width of the shoulders, when arms hang at the sides, will be about two-ninths of the height.

The leading characteristics of a good constitution are thus enumerated by Tripler: "A tolerably just proportion between the different parts of the trunk and members; a well-shaped head, thick hair, a countenance expressive of health, with a lively eye, skin not too white, lips red, teeth white and in good condition, voice strong, skin firm, chest well formed, belly lank, parts of generation well developed, limbs muscular, feet arched and of a moderate length, hands large. The gait

*If under 21 years of age, a reduction of 1 inch will be allowed.

should be sprightly and springy, speech prompt and clear, and manner cheerful. All lank, slight, puny men, with contracted figures, whose development is, as it were, arrested, should be set aside. The reverse of the characteristics of a good constitution will indicate infirm health or a weakly habit of body; loose, flabby, white skin; long, cylindrical neck; long, flat feet; very fair complexion, fine hair; wan, sallow countenance," etc.

Recruits must understand the English language sufficiently to receive orders, and have intelligence enough to execute them. They must have sound constitutions, and must in all respects be up to the standard herein set forth for service in the Connecticut National Guard. Surgeons will bear in mind that every disqualification for service in the United States Army must be carefully recorded, even when it does not disqualify for service in the National Guard.

Recruits must be examined by some authorized surgeon; and a full report of such examination (on blanks furnished for that purpose) must be filled out in ink and promptly transmitted to the office of the Adjutant-General through regular medical channels.

For each examination so made and reported the surgeon shall receive from the State a fee of one dollar.

The surgeon will make the examinations as privately as possible, in a large well-lighted room, with the recruit stripped.

To insure uniformity of results the following method of examination is recommended: The surgeon should ask the questions in the first part of the blank and clearly record the answers exactly as made, noting any indications therein for a special examination of the recruit. The recruit should sign the statement when completed. He should then, before stripping the man, note on the examination blank his name, weight, height, general appearance, and color of hair and eyes. Then note the rate and character of the pulse and respirations while sitting at ease. The mental and moral characteristics are next noted. A careful examination of the head, ears, eyes,

face, mouth, and fauces should be made, and any disqualification for service in the Army of the United States recorded on the examination blank.

In the United States Army, deafness of either ear constitutes an absolute cause of rejection. The examination should be made as follows, and the result noted on the examination blank:

"As the distance at which the natural tone of voice may be heard in a closed room, when both ears are normal, is about fifty feet, the distance at which the applicant is to stand from the examiner must be as great as the apartments will allow, not to exceed fifty feet."

"The recruit will stand with his back to the examiner, who is to address him in a natural tone of voice. When the distance is less than forty feet, it should be specified on the examination form, and the tone of voice will be lowered. Failure of the applicant to respond to the address of the examiner will demonstrate a defect."

Special attention must be given to closing the entrance to each ear separately, by pressing with the thumb the small lobe (tragus) situated in front of the opening to the inner ear.

Advantage should be taken of the absence of other sounds to make the examination. Surgeons should remember that a man may be totally deaf in one ear, and yet may hear all ordinary conversation perfectly if the sound ear is not completely stopped. "Deafness may be caused by an accumulation of hardened wax; therefore an otherwise desirable recruit should have his ears well cleansed before final action is taken in his case."

All men assigned to the artillery arm of the service shall, before such assignment, besides undergoing the ordinary examination, be examined especially with a view to establishing the fact of the patency of the Eustachian tubes and the integrity of the tympanic membranes, in default of which the men are unfit for that arm.

Inability to read or describe with facility the types or characters on the test cards.—This examination requires the great-

20 Feet.

M W E M E E

E M E E M E

20 Feet.

L B N T E P G

F N E O L E A

G C R F U J S

est care and patience on the part of the surgeon; it is made with cards bearing the twenty-feet test types and test characters.

To use the cards, measure off a distance of twenty feet in a straight line; place the applicant with his back to the light at one end of the line, while the examiner stands at the other and holds the card exhibiting the test types or characters in full view of the applicant and so that a good light falls on the card. Each eye should be examined separately, one being covered with a card (not with the hand) by the applicant. The surgeon then directs him to read the types on the card; if he cannot read, the card bearing the characters is presented to him, which he is directed to describe. The types should be read first from left to right, and then from right to left; the characters should be described as to the number of arms seen on each and the direction in which they are pointed, whether upward or downward, to the right or left.

If the applicant should be unable to read the test types or describe the test characters correctly with either eye at twenty feet, he must be directed to step nearer, and the distance at which he reads the types should be measured and noted on the examination blank.

"A large percentage of men are the subjects of slight visual defects, not to such an extent as to disqualify them for military duty, but sufficient to cause a little blurring or indistinctness in some of the letters of the required test, which may be increased by the nervous apprehension of failure. Ignorance, stupidity or fear on the part of an applicant are factors to be considered in making this examination, and unless the surgeon exercises sound judgment he will probably reject men whose vision is in reality good; hence plenty of time should be taken and slight errors, such as misreading a P or T for an F, provided the majority of the letters or test characters are read with facility, need not be regarded as a failure of the test."

PHYSICAL EXAMINATION OF A RECRUIT.
RECRUIT'S STATEMENT.

Name, : single, married*; age, yrs.; birthday, ;
 residence, ; race, † occupation, ;
 have you before applied for enlistment? If so, where? ; if rejected, for
 what cause? ; what sickness have you had, and at
 what age? ; nationality of father, ;
 if either parent has died, state cause, ; if brother or sister has
 died, state cause, ; have you found your health or
 habits to interfere with your success in civil life? ; are you subject to dizziness? ;
 to severe headache? ; to pain in the breast? ; to fluttering of the heart?...;
 to shortness of breath? ; to cold in the head? ; to coughs? ; to diarrhoea?
 ; to piles? ; to rheumatism? ; do you believe you are sound and well now?
 ; have you had sore eyes or any defect of vision? ; discharge from either ear? ;
 fits? ; if so, how frequently? a discharge of
 matter from, or a sore of any kind upon your penis, and when? ;
 any swelling about or of your testicles? ; a boil near the anus (fistula)? ; is your sense
 of hearing good? ; have you been ruptured? ; do you drink intoxicating liquors? If so,
 to what extent? ; have you been hurt upon the head? Answer
 fully, ; have you had a sprain? ;
 a stiff joint? ; a bone or joint out of place? ; or a bone broken? ;
 are you subject to painful corns or sore feet? ; mention carefully injuries or surgical opera-
 tions you may have had upon any part of your body, especially burns, cuts, severe bruises, etc.,

have you had yellow fever? ; small pox? ; when were you last successfully vacci-
 nated? ; have you ever been convicted of a felony, or been imprison-
 ed in a jail or penitentiary? .

I Certify, That I have with care asked the foregoing
 questions and have recorded the answers as made to me.

Recruit.

Surgeon.

* Cross which he is *not*—widower single. † White or Black.

SURGEON'S REPORT.

Height, in.; weight, lbs.; color of hair, ; of eyes, ; figure and
 general appearance, ; sitting at ease, pulse, No. ;
 character, ; respirations, No. ; character, .

1. All mental infirmities absent, except
2. All moral infirmities absent, except ...
3. All head disqualifications absent, except
4. All ear disqualifications absent, except

5. All **eye** disqualifications absent, except

Reads test type and describes test figures without glasses right eye, ft.; left eye ft.*

6. All **face** disqualifications absent, except

7. All **mouth and fauces** disqualifications absent, except

8. **Cerebo-spinal system** sound, except

9. All **general** disqualifications absent, except

10. All **skin** disqualifications absent, except

11. All **neck** disqualifications absent, except

12. All **spinal** disqualifications absent, except

13. All **chest** disqualifications absent, except

Measurement of chest at angle of scapula, fully expanded, in.; fully contracted, in.

left intercostal space

Apex beat of heart in. side nipple line† Body erect. Linear distances from interclavicular notch to crest of pubic bones. in.

Valvular sounds

14. All **abdominal** disqualifications absent, except

Measurement of abdomen at navel, in.

15. All **genito-urinary** disqualifications absent, except

16. All disqualifications common to **upper and lower extremities** absent, except

17. **Superior extremities** sound, except

18. **Lower extremities** sound, except

REMARKS:

*If glasses are worn, strike out *without*; if not worn, strike out *with*.

†Indicate how much **inside** or **outside** vertical line drawn through left nipple, recruit standing and breathing quietly.

I Certify That I have carefully examined the above-named recruit. He has no mental or physical defect disqualifying him for service in the Connecticut National Guard, and only those above set forth, for service in the Army of the United States. He speaks, reads, and writes the English language , his intelligence is , and he has presented satisfactory evidence of good character.

Place

, Conn.

Surgeon C.N.G.
Post Surgeon.

Date,

NOTE 1. This examination should be made by an Active Surgeon, C.N.G.; if none resides in the town, by a Surgeon (retired) C. N. G., or Post-Surgeon. As soon as completed, this form will be forwarded to the Surgeon General.

NOTE 2. This blank form will be held in the custody of the Surgeon, who will see to it that the questions are not made known to the recruit in advance of his examination.

NOTE 3. In case the word EXCEPT is not plainly canceled, it will be inferred that the question has been overlooked. Please review carefully before this leaves your hands. (All blank spaces on this form, except that reserved for the Surgeon-General, must be filled by the Examining Surgeon.)

Commander Co
Regt., C.N.G.
Enlisting Officer.

This recruit has been examined by me this
day of ,
and
is recommended for service in the
Connecticut National Guard.

Surgeon C. N. G.
Post-Surgeon.

Reviewed by me this
day of ,
and
approved.

Surgeon-General

EXAMINATION OF RECRUIT.

Name,
Enlisted at
this day of
Co .
by

Commander Co
Regt., C.N.G.
Enlisting Officer.

This recruit has been examined by me this
day of ,
and
is recommended for service in the
Connecticut National Guard.

Surgeon C. N. G.
Post-Surgeon.

Reviewed by me this
day of ,
and
approved.

Surgeon-General

The recruit should now be stripped, providing no disqualification for service in the Connecticut National Guard has been discovered. If such disqualification is found, the examination may stop here; but a full description of the condition must be given under the head of remarks, and the paper promptly forwarded to the office of the Adjutant General. Being stripped, the recruit should be put through the motions of walking, running, and leaping, and directed to take such positions as will demonstrate the action of all the joints; the pulse and respirations should be again noted while sitting.

Examine the skin, spine, cerebro-spinal nervous system, neck (especially for enlarged glands); *chest*—its shape (flat or pigeon-breasted), resonance, character of respirations; *heart*—sounds, impulse (position and force) action (as to regularity); abdomen (especially for hernia and enlarged glands in the groin); genito-urinary apparatus; anus (especially for fistula); upper extremities (especially for enlarged glands at the elbows); lower extremities.

TABLE OF PHYSICAL PROPORTIONS.

HEIGHT.	MINIMUM WEIGHT.	MINIMUM CHEST MEASUREMENT.	
		Inspiration	Mobility.
63 inches	- - -	Pounds.	Inches.
63 inches	- - -	110	32
64 inches	- - -	111	32
65 inches	- - -	114	32½
66 inches	- - -	116	32½
67 inches	- - -	118	33
68 inches	- - -	124	33¼
69 inches	- - -	130	33½
70 inches	- - -	135	2½
71 inches	- - -	139	34¼
72 inches	- - -	142	34¾
73 inches	- - -	147	35¼

An easy way to compute the *average* weight for any height is to calculate two pounds for each inch of height up to sixty-

seven inches, and add seven pounds for every inch above that height.

When measurements and weight approach the minima above given, extreme care should be exercised in the physical examination of the chest, and such other examination made as will exclude the presence of diabetes or other serious constitutional conditions. If the recruit is over 21 years of age his weight must be ten pounds more and the measurement of his expanded chest two inches greater than in the above table.

CONDITIONS EXEMPTING FROM ALL MILITARY DUTY.

Permanent—Idiocy, imbecility, dementia, all chronic forms of insanity; dislocations, or fractures so badly reduced as to disqualify for manual labor; deafness of both ears; loss of an eye; total paralysis of a limb, loss of either limb; organic disease of the heart; advanced phthisis pulmonalis; such herniae as cannot be held in place by a truss; any disease or injury as permanently disqualifies for remunerative labor.

DISQUALIFICATIONS FOR SERVICE IN THE UNITED STATES ARMY AND IN THE CONNECTICUT NATIONAL GUARD IN TIME OF PEACE.

I. MENTAL INFIRMITIES.

UNITED STATES ARMY.	CONNECTICUT NATIONAL GUARD.
Insanity, idiocy, imbecility, dementia.	Same for Connecticut National Guard

II. MORAL INFIRMITIES.

Intemperance in the use of stimulants or narcotics, conviction of felony, masturbation, sodomy.	Same for Connecticut National Guard.
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III. THE HEAD.

Abnormally large head; considerable deformities, the consequence of fracture; serious lesions of the skull, the consequence of complicated wounds or the operation of trephining; caries and exfoliation of the bone, injuries of cranial nerves, tinea capitis, alopecia.	Same for Connecticut National Guard.
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IV. THE EARS.

Deafness of one or both ears; all catarrhal and purulent forms of acute and chronic otitis media, polypi and single ear.	Same for Connecticut National Guard, except moderate deafness of a single ear will not disqualify. The re-
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UNITED STATES ARMY.

CONNECTICUT NATIONAL GUARD.

other growths or diseases of the tym-cruit should be able to repeat words panum, labyrinth, or mastoid cells; spoken in an ordinary tone at a dist-
perforation of the tympanum; closure ance of forty feet.

of the auditory canal, partial or com-
plete, except from acute abscess or
furuncle; malformation or loss of the
external ear and all diseases thereof,
except those which are slight and
non-progressive.

V. THE EYES.

Loss of an eye, total loss of sight of either eye: conjunctival affections, in-ganic diseases disqualify for service
cluding tracoma, entropion: opacities in the cornea, if covering part of a Loss of an eye or any part of an eye moderately dilated pupil: pterygium, is a disqualification. For the signal if extensive; strabismus, hydrophthal-service, the eyes should be up to the mia, exophthalmia, conical cornea, United States Army standard.
cataract, loss of crystalline lens, dis-
eases of the lachrymal apparatus, ec-
tropion, ptosis, incessant spasmodic motion of the lids, adhesion of the lids, large encysted tumors, abscess of the orbit, muscular asthenopia, nystagmus.

Any affection of the globe of the eye or its contents: defective vision, in-
cluding anomalies of accommodation and refraction: myopia; hypermetro-
pia, if accompanied by asthenopia;
presbyopia, astigmatism, amblyopia, glaucoma, diplopia, color blindness
(for signal service only).

VI. THE FACE.

Naevi, unsightly hairy spots, extens- Same for Connecticut National
ive cicatrices on the face. Guard, if quite marked.

VII. THE MOUTH AND FAUCES.

Hare-lip, simple, double, or compli- Same for Connecticut National cated: loss of the whole or a consider- Guard, except single hare-lip, when able part of either lip: unsightly mu- not conspicuous, will not disqualify. tilation of the lips from wounds, burns, Unless a recruit has four sound double or disease: loss of the whole or part of teeth, one above and one below on either maxilla, ununited fracture, anky- either side of the mouth, so opposed losis, deformities of either jaw interfer- as to serve the purpose of mastication, ing with mastication or speech, loss of he should be rejected. Absence of certain teeth, cancerous or erectile the front teeth will not reject. If the tumors, hypertrophy or atrophy of the quota of natural double teeth are ab-
tongue, mutilation of the tongue, ad- sent a good set of artificial teeth will hesion of the tongue to any parts, pre- be accepted, but their presence must venting its free motion; malignant dis- be noted on the examination form.
ease of the tongue, chronic ulcerations, fissures or perforations of the hard palate, salivary or bucco-nasal fistulae, hypertrophy of the tonsils sufficient to interfere with respiration or phonation.

VIII. THE CEREBRO-SPINAL SYSTEM.

UNITED STATES ARMY.

Epilepsy, chorea, all forms of par-
alysis, tabes dorsalis, neuralgia, stut-
tering.

CONNECTICUT NATIONAL GUARD.

Same for Connecticut National
Guard, except neuralgia must be per-
sistent to disqualify.

IX. GENERAL DISQUALIFICATIONS.

Feebleness of constitution (poor Same for Connecticut National
physique), scrofulous diathesis, can- Guard. Before pronouncing an applici-
cerous diathesis, syphilis.

Same for Connecticut National
Guard. Before pronouncing an applici-
ant syphilitic, at least two of the fol-
lowing characteristic signs of the dis-
ease should be discovered and noted
on the blank: painless, multiple, en-
largement of the lymphatic glands at
the back of the neck, on the inside of
the arm above the elbow, or in the
groin: a copper-colored eruption on
skin, without pain, itching, or surround-
ing hyperaemia (especially if on the
forehead or chest); scaly eruption on
the palms of the hands, hair very thin
or absent in patches (alopecia); char-
acteristic mucous patches or ulcers in
the mouth or nose; nodes on the shin-
bones, and warts about the anus. The
frequent respective symmetry of spyhi-
litic lesions should be remembered.

X. THE SKIN.

All chronic, contagious, and parasitic Same for Connecticut National
diseases of the skin; naevi; extens- Guard, except a chronic disease, slight
ive, deep, and adherent cicatrices, and not contagious, and small naevi,
chronic ulcers, vermin.

will not disqualify.

XI. THE NECK.

Goitre, ulcerations of the cervical Same for Connecticut National
glands, cicatrices of scrofulous ulcer- Guard, except goitre disqualifies only
ations, tracheal openings, wry neck, when so large as to interfere with
chronic laryngitis, or any other disease breathing or the hooking of the coat
of the larynx which would produce collar, or if recent or growing.
aphonia, stricture of the oesophagus.

XII. THE SPINE.

Caries, spina bifida, lateral curvature Same for Connecticut National
of the cervical, dorsal, or lumbar re- Guard, except gibbosity of the thorax,
gions; lumbar abscess, rickets, fracture which does not interfere with the free
and dislocation of the vertebrae, angu- action of the heart or lungs, need not
lar curvatures, including gibbosity of disqualify. "To detect curvature of
the anterior and posterior parts of the the spine, draw an imaginary line from
thorax. the center of the base of the skull to
the end of the spine. If it passes one
inch either side of the spinal promi-
nence, reject."—(Parker.) Something
more than one inch may sometimes be
allowed recruits for Connecticut Na-
tional Guard if otherwise sound.

XIII. THE CHEST.

UNITED STATES ARMY.

CONNECTICUT NATIONAL GUARD.

Malformation of the chest, or badly united fractures of ribs or sternum sufficient to interfere with respiration; caries or necrosis of ribs, deficient expansive mobility, evident predisposition to phthisis pulmonalis, chronic pneumonia, emphysema, chronic pleurisy, pleural effusions, chronic bronchitis, asthma, organic disease of the heart or large arteries, serious and protracted functional derangement of the heart, dropsy dependent upon a disease of the heart.

XIV. THE ABDOMEN.

All chronic inflammations of the gastro-intestinal tract, including diarrhoea and dysentery; diseases of the haemorrhoids need not disqualify. liver or spleen, including those caused by malarial poisoning; ascites, obesity, loose flabby folds of skin about the dyspepsia, if confirmed; haemorrhoids, verge of the anus, and may be recent prolapsus ani, fistula in ano, consider or old. If recent, they will appearable fissures of the anus, hernia in all about the size of a buck-shot, of a bluish color, hard and tense to the feel, and their covering will look thin. If old, they will probably be as large as a marble, of a brawney feel, reddish-brown color, and have a thick covering. If recent, as above described, they are not cause for rejection, neither are they if old and single and the applicant asserts that they have never been painful or troublesome; but if there should be more than one old pile and they are larger than described, or if a single old pile is ulcerated or inflamed, or if there is a small pile associated with varicose veins of the legs, the applicant should be rejected. The flabby folds of skin are not cause for rejection unless very large."

XV. THE GENITO-URINARY ORGANS.

Any acute affection of the genital organs, including gonorrhoea and venereal sores; loss of the penis, phimosis, one or both testicles within the abdominal structure of the urethra, loss of both men, and a moderate hydrocele or testicles, permanent retraction of one varicocele need not disqualify. or both testicles within the external ring, any chronic disease of the testicle, hydrocele of the tunica and cord, atrophy of the testicle, varicocele, malformations of the genitalia, incontinence of urine, urinary fistulae, enlargement of the prostate, stone in the bladder, chronic cystitis, all diseases of the kidney.

XVI. AFFECTIONS COMMON TO BOTH UPPER AND LOWER
EXTREMITIES.

UNITED STATES ARMY.

Chronic rheumatism, chronic diseases of joints, old or irreducible dislocations or false joints, severe sprains, relaxation of the ligaments or capsules of joints, dislocations, fistulae connected with joints, or any part of bones; dropsy of joints, badly united fractures, defective or excessive curvature of long bones, rickets, caries, necrosis, exostosis, atrophy or paralysis of a limb; extensive, deep, or adherent cicatrices; contraction or permanent retraction of a limb or portion thereof, loss of a limb or portion thereof.

CONNECTICUT NATIONAL GUARD.

Same for Connecticut National Guard, except moderate exostosis, non-syphilitic, need not reject.

XVII. THE SUPERIOR EXTREMITIES.

Fracture of the clavicle, fracture of the radius and ulna, webbed fingers, permanent flexion or extension of one or more fingers, loss or mutilation of a thumb, which as well as irremediable loss of motion does not interfere with cocking the of these parts; total loss of either rifle, and partial flexion of the little thumb, mutilation of either thumb, finger, will not disqualify. total loss of the index finger of the right hand, loss of the second and third phalanges of all the fingers of either hand, total loss of any two fingers of the same hand.

XVIII. THE LOWER EXTREMITIES.

Varicose veins, knock-knees, club feet, splay or flatfeet, webbed toes, the Guard, except varicose veins when toes double or branching, the great only moderately prominent, not extending the other toes, bunions, ing above the knee, and not accompanying, overriding or superposition of pied by chronic tumefaction, dropsy, or any of the toes to an extreme degree, marks of ulceration of the limb, need loss of a great toe, loss of any two toes not reject. Knock-knees, unless very of the same foot, permanent retraction marked, do not reject. Splay-feet of the last phalanx of any of the toes, cause rejection when the entire inner or flexion at a right angle of the first border of the foot rests upon the ground phalanx of a toe upon the second, with the inner part of the ankle joint with ankylosis of the articulation; in- very prominent. To disqualify, over-growing of the nail of the great toe, riding of the toes, corns, and bunions stinking feet.

Same for Connecticut National Guard, except varicose veins when toes double or branching, the great only moderately prominent, not extending the other toes, bunions, ing above the knee, and not accompanying, overriding or superposition of pied by chronic tumefaction, dropsy, or any of the toes to an extreme degree, marks of ulceration of the limb, need loss of a great toe, loss of any two toes not reject. Knock-knees, unless very of the same foot, permanent retraction marked, do not reject. Splay-feet of the last phalanx of any of the toes, cause rejection when the entire inner or flexion at a right angle of the first border of the foot rests upon the ground phalanx of a toe upon the second, with the inner part of the ankle joint with ankylosis of the articulation; in- very prominent. To disqualify, over-growing of the nail of the great toe, riding of the toes, corns, and bunions stinking feet.

must render the wearing of a shoe painful. Webbed toes do not disqualify unless all the toes of a foot are joined together.

Reprints and Translations.

THE TREATMENT OF WOUNDED IN NAVAL ACTIONS.*

BY FLEET SURGEON GILBERT KIRKER, R.N., M.D., M.CH., M.R.C.S.

THIS subject may be conveniently dealt with under the three following heads:

1. The surgeon's station or the place where the wounded are treated.
2. The time of treatment.
3. The conveyance of the wounded.

1. *The Surgeon's Station.*—It has always been the custom to select some well protected and easily accessible part of the ship for the reception and treatment of the wounded, and to convert it, before action, into a surgical station. In the old wooden battleships the "cockpit," or after part of the orlop deck—a place below the water-line, and approached by a wide hatchway—was universally selected as the surgeon's station, and many of the scenes which have occurred there have found their way into history and art.

When the iron battleship displaced the wooden one the orlop deck and cockpit disappeared, and naval surgeons lost their prescriptive station in action. Then, on board each ship, the captain and medical officer selected the place they considered most suitable, and adapted to the chosen station the details of the necessary arrangements. It is in this way that the location of the surgeon's station is still settled; and, owing to the variations in ship construction, it must be so settled until the time comes when ships will be fitted with an

*Read before the Navy, Army and Ambulance Section of the British Medical Association and reprinted from the *British Medical Journal*.

operation room below the water line—a modern cockpit—which can be used both in peace and war.

This suggested operation room, it appears to me, should be included in the internal arrangements of every modern battleship and cruiser. It need not be large, but it should be fitted up to meet the requirements of aseptic surgery. Neither need it be particularly easy of access, for with my "ambulance sleigh" injured men can be easily and safely taken down and along all ordinary hatchways and passages. During peace important surgical operations would be done in it instead of in the overcrowded sick bay, and in it also the valuable surgical instruments and necessaries would be kept in readiness for use. In time of war the surgeons, surgical instruments, and dressings would be protected in this place during action, and after action surgical operations could be done in it with more chance of success than in constantly used bathrooms or greasy mess places. The preservation of the lives of surgeons and the surgical appliances during action must receive adequate attention, if such disasters as that which occurred in the Japanese ship *Hujei* at the battle of Yalu are to be avoided. In this ship the surgeon's station was in the unprotected wardroom. Here a shell entered and exploded, killing or severely wounding the surgeons, nurses, and most of the wounded who had been brought there for treatment, and destroying all the surgical instruments and dressings. This shell also set fire to the ship, and in separating from her consorts to extinguish the fire she lost them, and was without medical assistance of any kind until the following forenoon. When the surgeons who came to her assistance got on board, they found twenty corpses and thirty-five wounded men.

2. *The Time of Treatment.*—In all modern navies it has always been the custom in time of war, and, until recently, the intention in time of peace, to remove the wounded at once from where they fell to the surgical station for immediate treatment. It has, however, for some time been inferred that that in future naval warfare it will not be practicable to remove the wounded during an action, but that they will have

to shift for themselves until it is over or a lull occurs in the fighting; and the experience of the Japanese in their naval battles in the late war with China must be taken as demonstrating that this inference is correct, and that the practice of the past must be abandoned.

Of course, the conditions that have brought about this proposed revolution in the treatment of naval wounded are connected with the construction of modern ships and the nature of modern



THE AMBULANCE SLEIGH,
USED AS A SLEIGH AND AS A WHEELBARROW.



THE AMBULANCE SLEIGH.
USED IN SWINGING PATIENTS OVER THE SIDE AND AS
A WHEELBARROW.

fighting, but there are also other conditions which though by themselves would not justify a departure from the old custom, yet show that the new intention is not so inhuman as it would at first sight appear. Thus the duration of a modern naval action is short, the wounds are rarely attended with dangerous bleeding—not so often as in the days of solid projectiles—there are few suitable places on board a ship where the wounded would be safer than where the bulk of the

men are fighting; and during an action, as the Japanese found, the surgeons are not able to do work of any value. M. Fontan, Medecin en chef de la Marine de France, in a paper which he read at the International Medical Congress in Paris in 1890, stated that it had been practically decided in the French Navy not to attempt to give treatment, altogether illusory, to wounded during action. The men should receive an elementary instruction in how to assist themselves, and a goodly supply of stimulating and restorative drinks should be provided before the action began.

3. *Conveyance of Wounded.*—Though the wounded may be allowed to remain where injured during an action, when it is over they will have to be moved either for treatment on board their own ships, or, what will be better if obtainable, discharge into hospital ships.

For the conveyance of sick and wounded men on board ship, both in peace and war, many contrivances have been proposed and used, but except the service cot, stretcher, and

ambulance hammock, none has received official recognition. As far as I am aware, this is also the state of matters in all foreign navies except those of France and Chili, in which M. Auffret's *gouttiere metallique* has been adopted. The Japanese during their war with China were only provided with the ordinary appliances I have mentioned, and, as might have been expected, they found these useless under the conditions of war. They threw them aside, and carried



THE AMBULANCE SLEIGH,
HOISTING PERPENDICULARLY THROUGH A HATCHWAY.

the wounded by hand alone. This method, however, has two great disadvantages—the large number of men required to carry the wounded, (four for each) and the great danger of aggravating the injuries, especially when there is fracture of the bone.

An ambulance to be suitable for use on board ship must satisfy several conditions. It should be able to retain its occupant safely in all positions, from horizontal to perpendicular—it should be able to go down a hatchway by sliding down the ladder, if there is one, or by being lowered at any angle, if there is none; it should be as short as possible in order to get easily round corners; and in confined spaces, where there is not room for two men to carry it, it should be transportable by one.

As far back as 1896 I brought under the notice of the Naval Medical department an apparatus which I had invented to meet these conditions, and which I now call an "ambulance sleigh." Not meeting with approval when brought forward, on account of its size and weight, I allowed it to lie aside for fourteen years. Last year, when attending the International Congress at Paris, I became aware of the existence of M. Auffret's *gouttiere metallique*, which has lately been introduced into the French and Chilian navies, and on which its inventor began to work in 1892. This apparatus I was surprised and pleased to find was constructed much on the same plan as my ambulance sleigh, except that it lacked the distinctive and most valuable sleigh characteristic of my apparatus. On returning to England I resurrected my old invention, lightened and improved it, and it is now undergoing official trial.

The illustrations demonstrate its suitability for all the necessities of the transport of wounded or helpless persons, on board present-day men-of-war with fighting tops, narrow passages and hatchways, and ammunition hoists. It will be seen that it can be slung or suspended, carried as an ordinary stretcher, wheeled barrow fashion on castors at the ends of the carrying handles which are hinged so as to fall back under either end of the cot to permit of its being trundled along the

deck or passage ways, slid on its sleigh attachments down ladders or other inclines, or suspended from the head end perpendicularly; for lowering down narrow hatchways, etc., the occupant being securely held in the cot by means of the perineal support and three broad belts strapped across body, thighs, and legs respectively. The floor of the cot also slopes down from the head to the perineal support, rises from there for the thighs and falls again from the knees to the feet. The original objection to its weight and size has been to some extent surmounted ; it now weighs 35 lbs., measuring 7 feet 2 inches long when carried as a stretcher, and 6 feet 2 inches when the handles are folded back ; its breadth is 21 inches at the head, 18 inches at the foot ; the weight includes the cushion or mattress lining of cot. Possibly its weight might be further reduced by the use of aluminium in place of steel or iron in the construction of the cot frame, etc., combined with bamboo or rattan work. As stated above an almost similar appliance has been adopted in the French and Chilian navies, and it would appear well adapted to many circumstances in civil life, as in mines, collieries, etc.

To make more complete my reference to the conveyance of wounded on board ship, I must mention some of the other contrivances which have been from time to time proposed. Among them are modifications of the service hammock (Macdonald), cot (Gihon, Gorgas and Loyd), and stretcher (Dick), and Mowll's patent chair.



SOME REMARKS, BY WAY OF CONTRAST, ON WAR SURGERY OLD AND NEW.*

BY SIR WILLIAM MAC CORMAC, BART., K.C.B., K.C.V.O., M.A.
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LONDON, ENG.

ON October 1st, 1856, Mr. M'Whinnie, assistant surgeon to St. Bartholomew's Hospital, delivered the introductory address at that institution. In the course of it he referred to the Crimean War, and many of his remarks are applicable now. He said that, "although the military surgeon enjoys certain advantages which the events of the late war promise to render greater, we must not conceal the fact that military surgeons have not yet attained the position to which their varied acquirements, skill and devotion, fairly entitles them." Speaking of the return of the victorious regiments and the enthusiasm which accompanied their triumphal entry he called to mind the glorious part our own professional brethren had taken in the struggle, and that the surgeons had, as in preceding wars, distinguished themselves by their skill, devotion, bravery and humanity. He quoted Colonel Ambert, a French colonel of dragoons, who had used in October, 1854, generous and eloquent words in describing the qualities of the medical officer. "In the hour after the battle he will be chief among the multitude, during the fight calm, when all around is agitated and disturbed. In an atmosphere of grape shot and smoke he must deny himself all emotion. The shrieks of the wounded, the booming of cannon, and the crash of shells, do not disturb him—all ranks appeal to him for help, and he gives it alike to the poor soldier or to the mighty general, to the fallen amongst the enemy, and the wounded of his own army.

*Remarks before the Navy, Army and Ambulance Section of the British Medical Association and reprinted from the *British Medical Journal*.

"After the battle the general and his soldiers hear the shouts of triumph, but the surgeon has to listen to the groans of the sufferer; night comes on and all are asleep save him, awake amongst the wounded, and next day, exhausted with fatigue, he sets out again with his ambulance, giving hope to all, improvising a thousand methods, and supplying material means of aid by the power of his intelligence and skill, honour then to him: his mission is a thousand times sacred.

"Fellow citizens, you who were so moved at the heart-rending sufferings of your soldiers in the East, the military surgeon has saved your sons, though he may himself have died at his post, and the heroism of science has equalled, if it has not surpassed, the bravery of the field of battle."

Mr. M'Whinnie pointed out that "from evidence given before Parliamentary committees, and other undeniable testimony, it was clearly shown that the blame attached to the medical department at the beginning of the Crimean campaign was undeserved, and had the hygienic measures suggested by its members been carried out the losses and sufferings of the army would not have been greater than those which attend the ordinary casualties of war, and that when the injunctions of our military brethren were attended to the health of our troops soon became most satisfactory."

Dr. Balfour—then of the Royal Military Asylum, Chelsea, whose authority is entitled to the greatest attention and respect—writes that "so far as I can learn from competent judges there has been an amount of good surgery, which surpassed the anticipations of even the best friends of the department, and I believe we are far ahead of the French army in that respect."

The wars which compare with that in South Africa in regard to length of the struggle, numbers of wounded, and strain upon the Army Medical Department are the Peninsular and Crimean wars, the American war of the Rebellion, and the Franco-German war.

Many lesser campaigns have intervened, such as the Egyptian and the Indian wars, and the struggle between China

and Japan, but these are not epoch-making like the other great wars, and do not constitute milestones along the march of military medical progress. In considering this question, we must also remember there is much concerned beside the mere treatment of wounds. There is the organization of the Medical Corps, the improvement in the means of transport of sick and wounded, the formation of hospitals, and the commissariat supply.

We scarcely remember it now, but chloroform was first tested on a large scale in the field during the Crimean campaign, and its success was complete. Macleod says there was but one death which can fairly be said to have arisen from it. Baudens tells us that chloroform was administered some 25,000 times in the French army, and that no fatal case had occurred.

It was found even more precious in the field than in civil practice by relieving shock and permitting many primary amputations which could not otherwise be performed. Fewer assistants are required when it is employed, which materially adds to its value. Mr. Blenkins, of the Guards, remarks that without the aid of chloroform many severe operations could not have been undertaken or performed at all.

The next great war was that of the American Rebellion, and the records of its results are to be found in the monumental volumes issued from the Surgeon General's office.

In the Austro-German war of 1866 antiseptic surgery had not been introduced, nor was it employed during the Franco-German war of 1870-71, except to a quite limited extent upon the German side.

The mortality after operation was then very great indeed on both sides, and especially in the French army. All kinds of infective diseases prevailed—septicæmia, pyæmia, and tetanus were common, most indeed of the operation cases died pyæmic, suppuration was universal, gangrene and secondary haemorrhage were frequent. Wounds of large joints entailed fatal results, abdominal wounds were scarcely ever recovered from, and one-half or more of the cases of chest injuries died. Fractures of long bones were always very serious, especially

those of the femur; amputations were frequent, and attended by a large mortality ; while excisions of joints, in the lower limb at all events, were most unsatisfactory, if performed as primary operations. A very large proportion of those who died on the field of battle, if not killed immediately perished from hemorrhage. Operations, however, were almost invariably performed with the assistance of chloroform, and an infinite amount of suffering was thus saved.

The large bullets of former campaigns, weighing often twice as much as those now in use, inflicted most extensive damage both on the soft parts and the bones, the comparative magnitude of the injury and the imperfect means of guarding against sepsis offer a sufficient explanation of the high rate of mortality.

In the war between Russia and Turkey a systematic attempt was first made by Professors Bergmann and Reyher to treat gunshot wounds of the knee antiseptically with very great and, at the time, astonishing success. In the campaign in Egypt in 1882 antiseptic methods were so effectively carried out that there was not throughout a single case of erysipelas, pyæmia, or septicaæmia, or of any infective preventable disease.

I do not mean in this brief communication to enter into minute details or to give you many statistics—indeed, from South Africa there are as yet no complete ones available. I would only seek to indicate in a general way some of the improved conditions of modern warfare as exemplified in South Africa.

The use of chloroform was universal, and that not less blessed agent in relieving pain, morphine; in this way the detrimental influence of shock was much lessened. But shock is less severe in the case of the modern bullet than previously was the case, due no doubt to the different character of the wound.

The limited amount of local damage produced in most instances by the comparatively small and very swift Lee-Metford or Mauser bullet has impressed all observers. The normal external wound is circular and quite small, like the end of

an ordinary pencil, and it soon became sealed with a black scab of dried blood. The exit wound is often quite similar, or like a small slit, and closes in the same way. The soft parts and bone are damaged as a rule in a limited degree, and recovery generally took place rapidly and without complication.

The bullet seems to be itself aseptic; clothing is very seldom carried in with it; the bullet track behaves more like an incised wound than a contused one; the rapid manner in which the small external wounds seal up reduces the injury to the subcutaneous form, and the frequency of recovery is proportionately great.

The manner in which the bullet may traverse the abdomen, thorax, cranium, the great joints, and important viscera, not only without entailing a fatal result, but often producing only a minimum of constitutional or other disturbance, must be witnessed to be realised.

I was much impressed with the small number of cases of primary fatal haemorrhage and the large number of traumatic aneurisms. The large vessels, even including the innominate artery, may be wounded by a bullet without causing fatal bleeding, and often with a surprisingly small amount of haemorrhage either external or internal—a totally new experience.

In the Crimea and in the Franco-German war the estimated proportion of deaths from primary haemorrhage on the field of battle was about 20 per cent., and it was thought beforehand that the small hardened bullet would probably greatly increase the number, but this is not true, and in South Africa and in the Cuban war death from this cause was found to be comparatively rare. The same comparative infrequency may be stated in respect of secondary haemorrhage.

Wounds of the blood vessels are generally followed by aneurismal swellings sometimes arterial, more frequently arterio-venous. The treatment of these cases is difficult, and many I am convinced should if possible be left alone. Unless immediate interference is indicated by some urgency such as fresh haemorrhage, pressure symptoms, or impending gan-

grene the longer the interval permitted before operation the better the prospect of ultimate success; besides, some cases get well spontaneously. In those operated upon the ligation of the vessels at the seat of injury remains for most cases the classic and safest treatment, but it is often attended by the greatest difficulties and often followed by gangrene.

The treatment of the larger proportion of Mauser wounds is generally of the expectant kind, and of none may this be more correctly stated than of wounds involving the abdominal cavity.

Many surgeons went to South Africa anticipating a large field of surgical enterprise in this direction, but I feel sure the surgical records of the campaign, when published, will prove the advantages of non-interference in the greater number of instances, and this has also been the experience of the American surgeons in the war with Spain where the weapons used were precisely similar. There all the abdominal cases but one operated on died, while many treated expectantly recovered, but the general mortality was as high as 70 per cent. of the total, while in the Civil War the mortality reached 87 per cent. The liver, kidneys, and spleen may be perforated and yet recovery ensue. The large intestine, and, I believe, the small intestine also, must have been frequently perforated without fatal consequences. The small perforation caused by the Mauser bullet and the frequently empty condition of the bowel are the principal factors to account for a non-fatal issue.

In every region of the body the percentage of cases terminating fatally is diminished. Formerly a gunshot fracture of the femur formed a serious menace to life, and determined not infrequently an immediate amputation. In the Civil War of 6,576 fractures of the femur nearly 3,000 (2,923) were treated by primary amputation, and the mortality following the injury amounted to 50 per cent.

In the Spanish-American war, of 82 cases of gunshot of femur 6 only were amputated, while 74 were treated conservatively. We do not yet know the mortality results in South Africa, nor do I know of any uncomplicated cases of gunshot

fracture of the femur treated by primary amputation. I fancy there must have been very few. Recovery was looked upon as the ordinary result, although union was often considerably delayed, and the risk to life and limb was increased the higher up the fracture; while possibly 15 to 20 per cent. were amputated for various causes later on. I think the record of this war will show amazingly few primary amputations for injury, but a certain number had to be performed at a later period on account of septic conditions.

The way in which many perforating wounds of one side or both sides of the chest recovered was nothing short of marvelous. Very often the most trivial inconvenience was the result — trifling dyspnoea, perhaps, or haemoptysis, which was often absent and frequently insignificant, and complete recovery followed in a few days. In other cases there was more or less hemothorax, and in a few pyothorax; what the ultimate mortality table may show we do not yet know, but it will not be very large. In the Franco-German war half the cases terminated fatally, and in the Civil War the mortality was as high as 62.6 per cent.

It may be taken as proved that a Mauser or Metford bullet may traverse the knee and other articulations and fracture the bones, entering into the joint without causing any risk to life or limb, or even any permanent disablement. The old difficulty as to amputation or resection did not arise, the treatment was expectant, suppuration was rare, and when passive movement was commenced sufficiently early excellent functional results followed.

In the sketch to which I have limited myself, I think enough has been said to show how completely the character of gunshot injuries is changed. Their severity is not only diminished, but also their relative frequency, so that the progressive improvement in lethal weapons does not appear to render the prosecution of war more difficult, or to render it impossible as some have recently contended.

In the American Civil War 1 man was killed for every $4\frac{1}{2}$ wounded, while with the Mauser bullet the proportion of

killed to wounded is 1 to $7\frac{1}{2}$. Only 6 to 8 per cent. of those wounded now die, whereas in the Civil War the percentage was $14\frac{1}{2}$; this is due, no doubt to the altered character of the injury, and also, in no small measure, to improvements in the method of treatment.

It has often been forgotten what a complete change there is in the battles of this present war from any that have gone before. Stress is placed upon our losses, but they are almost insignificant in comparison with those of former times. In the Crimea they reached nearly half our strength. There was no trained transport corps, nor hospital service, nor adequate system for the care of the wounded on the battle field at the beginning of the war, and numbers died on board the ships transporting the sick and wounded to Scutari in consequence of the inadequate preparation, although it is a journey of only 36 hours.

Now the enemy is for the most part unseen, and the smokeless powder fails to give any sign of his whereabouts. At some of the earlier battles--that of Colenso, for instance--the Boers were invisible during the entire day; not a single Boer was seen by our men, and the result was that the enemy only lost 5 killed and 25 wounded; while on our side there were 1,100 casualties.

What a contrast is this to the early battles of the Franco-German war, with their brilliant cavalry charges and their masses of men hurled at the objective, without heed of the loss incurred; they were literally decimated. At Gravelotte, on August 16th, 1870, each side had 16,000 men placed *hors de combat*. On the 18th, two days later, occurred the terrible struggle of St. Privat, where 120,000 French were pitted against 180,000 Germans. The artillery, the mitrailleuses, chassepots and needleguns, plied against one another in the open. Five times Steinmetz's sharpshooters were driven back, and many corps lost half their officers. The Prussians were repeatedly repulsed with fearful loss, and at 7 in the evening Bazaine and his officers considered the field was won. But at 9 the Prussians again attacked, and in the early morning the

Royal Guards advanced up the exposed slopes of St. Privat against Canrobert.

They assaulted one position after another in superb fashion, but the slaughter was dreadful; almost all the principal officers were struck down, the colours exchanged hands several times, and 160 German officers and 4,000 soldiers were laid low in the attempt. Nevertheless the Germans poured in regiment after regiment, 14 Saxon batteries of artillery were added to the ten Prussian ones, and as the sun was setting, the Saxon regiments of the Guard, drums beating and trumpets calling, rushed at the double on Canrobert's forces; there was fighting in the streets, in the houses, in the cemetery, man to man with bayonet and butt end of musket, and the place was taken.

The French lost that day 12,000 men and the Germans more than 20,000, amongst them the flower of the army, for the Prussian Guard had 300 officers and 8,000 soldiers either wounded or killed. One of them was Langenbeck's son, who told me he had spent many long hours in search of him only to find him mortally wounded.

The Germans nearly lost the battle, and would certainly have lost had Bazaine come to the assistance of his colleague. He heard the guns, and was informed of the situation by Marshall Lebouef, yet he never left his office at Plappeville. Soon afterwards Moltke's supreme knowledge shut him up helpless with 170,000 men in Metz, and a little later, on October 29th, Metz la Pucelle and all this great French army was forced to surrender.

In some of the great Napolean's battles as many as 38 per cent. were disabled; at Waterloo the number was 24 per cent. At Koeniggratz, the bloodiest battle of the war of 1866, it was 7½ per cent. At Mars le Tour it was 16 per cent., and at Sedan 12 per cent. I was there that day, September 1st, 1870, when the French lost 3,000 killed and 14,000 wounded—not very far short of our total loss for the entire period of the war in South Africa.

During twenty-one months of this war, from the beginning up to the end of June, 4,355 officers and men have been

killed in action, 18,291 were wounded, and 1,493, or 8.1 per cent., of the wounded died.

Modern troops in the field are now supplied with a packet of antiseptic material called a "first field dressing." It is hermetically sealed, and carried in a special pocket in each soldier's jacket. If a surgeon be near, he applies the gauze contained in the packet to the wound, and fastens it on with the bandage supplied; or the wounded man himself does it, or his comrade for him, as every man is taught its use and application. It certainly helps somewhat, and comforts the wounded; but I do not myself much believe in its antiseptic adequacy, and it often slips out of place.

Later on the Roentgen rays are of great service; they localise the foreign body when lodged, and determine the extent and direction of a fracture. They should serve to abolish the use of the probe, which is a fertile cause of mischief and of needless pain and suffering.

Before the regimental system ceased to be each regiment had a surgeon-major, and two assistant surgeons. In time of peace there was very little for them to do except to look after a few sick in the regimental hospital. In time of war they accompanied their regiments into action as at Waterloo and in the Crimea, and tended the wounded, often under fire. When the regiment moved on the wounded had perforce to be left behind to the chance care of such persons as could be found to look after them, and there was practically no organised system of transport, field hospitals, and bearer companies.

The organization of the transport of wounded from the field to the field hospital, and thence to the stationary and base hospitals, is now very complete, and worked well in South Africa. Formerly the wounded might have to lie for days unintended, now they are looked after with the least possible delay, and passed along the continuous relief chain from the front to the base with a minimum of hardship and delay. I myself saw many who had been exposed after Sedan for three or four days, and some were even longer, without any succor.

The hospital ships and hospital trains are comparatively

new departures, and of immense value in modern warfare. The ships were, I consider, something as near perfection as anything human can be, and the hospital trains did splendid work. One officer I knew—Major Brazier-Creagh—lived for twelve months in one of these trains, almost constantly on the move. During the period of twelve months and six weeks that Major Brazier-Creagh commanded this train he conveyed 16,485 officers and men from the battlefields and along the lines of communication, covering a distance of 34,473 miles. The train was several times under fire, and was shelled on two occasions. It was also in collision, and more than once in imminent risk of being wrecked by the Boers; and the Princess Christian Train made 102 journeys, carried 7,000 patients, and traversed over 30,000 miles up to June last, and is still at work with the same staff of surgeons and nurses on board as at the beginning.

At the battle of Colenso before the firing had ceased, a hospital train was loaded with 120 wounded men, every one of whom had been previously dressed and otherwise attended to by the bearer companies. This train, with its occupants lying comfortably in their cots, was soon speeding on its way to the general hospital at Maritzburg. A few days later these and other wounded men were sent on to one of the hospital ships, provided with every medical and surgical requirement and luxury, awaiting their arrival at Durban. Many thus found themselves aboard ship, in a swinging cot, in the fresh sea air, a couple of days after they had been wounded some 150 miles inland. What a contrast to the incidents which took place in the Crimea and on some battlefields in India, where the wounded had often to be left for days upon the field, being frequently plundered and sometimes killed by murderous thieves amongst the camp followers!

DISCUSSION.

DR. FARQUHARSON, M. P., congratulated the section on having had the opportunity of hearing from a surgeon of Sir William MacCormac's unique and varied experience the results of military surgery in South Africa, in comparison with

those in previous campaigns. His address formed a complete and forcible vindication of the Army Medical Department and their admirable work in South Africa under conditions of exceptional difficulty and danger, and at times when the society globe trotters, who afterwards posed as critics, were comfortably in bed after a good dinner. This work had been insufficiently appreciated, and the department had felt rather strongly that their proceedings had been specially subjected to hostile criticism, and that it was thought necessary to appoint a commission to make inquiries, whilst the purely military side of the campaign had hitherto escaped hostile comment and investigation. The commission was composed of able and trustworthy men, who took a calm, judicial, and dispassionate review of the situation, and it was unjust, cruel, and even libellous to characterise their report as a whitewashing one. Reading between as well as on the lines, they found some emphatic condemnation of the insufficient appreciation by the Government of the difficulties of the situation, but at the same time they praised highly the skill, devotion, and humanity shown by the army doctors under conditions of absolutely unprecedented difficulty. Undermanned as they were, compelled to attend vast numbers of sick and hurt, encountering overwhelming difficulties of transport and hospital accommodation they still attained results unknown in previous warfare. The climate had something to do with this, as well as the Mauser bullet, but much was due to the early antiseptic dressing on the field, as well as to the skill and care with which the wounded were afterwards treated.

FLEET SURGEON G. KIRKER, R. N., said he had listened with great pleasure to the very interesting and instructive address of his distinguished countryman and townsman, Sir William MacCormac. He did not propose to refer to Sir William MacCormac's paper further than to observe that it showed the great difficulties with which the R. A. M. C. had to contend and the splendid results which in spite of these difficulties they achieved. With the permission of the Section he wished to refer to a somewhat personal matter, in connection with the nature of modern small-bore bullet wounds, a subject which Sir William McCormac shortly treated. Through Sir William MacCormac's instrumentality he had the opportunity of observing bullet wounds in the Russo-Turkish war of 1877-78, and he presumed to regard himself as the prophet of the humane character of modern bullet wounds of which they heard so much now. In Turkey he saw compound fractures of the thigh which healed without suppuration, perfor-

rations of the knee-joint which healed without trouble, and cases of penetration of the chest from side to side which recovered without a bad symptom. When he returned home he made experiments on the subject of rifle bullet wounds, and based on these observations he brought forward the then new doctrine that rifle bullet wounds were less severe than round bullet wounds, and would be the more so the more their peculiar characters—especially smallness of diameter and hardness—were accentuated. He also pointed out that the splendid results, especially in the treatment of penetrating wounds of the knee-joint in the hands of Dr. Reyher, which were attributed to anti-septic treatment, were to a great extent probably due to their being produced by rifle bullets. A similar remark had recently been made by surgeons who had been out in South Africa, and several characteristics of small bore rifle wounds had been brought forward in connection with the South African war which he brought forward twenty years ago. His papers on the subject were one in the Transactions of the International Medical Congress of London, 1881, and another read at the meeting of the British Medical Association in Belfast in 1884 and printed in the *British Medical Journal* in the following September.

SURGEON GENERAL O'DWYER pointed out that with a force extended over a frontage of three miles, as was the case at Waterloo, it was much more easy to remove the wounded promptly than when they are scattered over an advance extending over twenty miles—and Lord Roberts informed the troops at Bisley the other day that future wars against troops armed with modern rifles must be in the very extended formation. It would require a great increase of medical personnel as well as of the transport for medical purposes. Surgeon-General O'Dwyer fully corroborated Sir Wm. MacCormac's experience as to the benign character of the modern small-bore bullet. He also pointed out the difficulties the medical service had to contend with in improvising personnel and equipment only intended to be sufficient for a force of 70,000 men to suffice for a force of 200,000, for it appeared from the evidence given by the Chief Ordnance Officer at Woolwich Arsenal as given before Mr. Justice Romer's Committee that after the hospital equipment for the first two army corps 70,000 men had been despatched, only one general hospital and three stationary hospitals remained in store to meet the requirements of the remaining 130,000 men added to the South African field army.

SURGEON GENERAL HAMILTON commented on the various

forms of bullet that had been in use in the British army. Commencing with the original spherical, and passing on to the Minie, the Enfield, the Snider, with its expanding, indeed almost explosive bullet, the Martini, and finally the Lee-Enfield of 0.303 bore. He alluded to the great penetration of the present bullet, deprecating in the strongest terms the use of expanding bullets, and proposed a motion on the subject.

SURGEON MAJOR POOLE said his experience of the South African war had been gathered from his connection with the Soldiers' Help Society, and pointed out that the worst cases of injury had been from the use of explosive bullets; the present bullet was comparatively harmless—men coming to his study for help to work who had had a bullet entering one side of the head behind the ear and passing out at the right eye, whose appearance and behaviour had been that of happy individuals.

SURGEON GENERAL HARVEY (Director General I.M.S.) thought that in justice to the Government of India he should mention that the first field dressing had been used in all recent Indian campaigns. The surgical results of these campaigns had been excellent; in the second Mirangui expedition of 1891 less than 3 per cent. of the wounded had died, and the proportion of deaths among the wounded in the Tirah campaign was very small. He entirely agreed that in fighting with a civilized enemy the use of expanding bullets should be absolutely prohibited, but in the case of savage foes who were determined to kill their enemy though they died for it, the case was different. A fanatical Ghazi was not checked by the modern bullet, which went through him like a knitting-needle through a pat of butter, and it seemed to him quite legitimate to stop him by any means necessary, including the Dum-dum bullet. It was false humanity to allow our own men to be killed rather than to take means to effectually prevent this by disabling the enemy.

MR. J. W. SMITH (Manchester) said that from his experience in the South African campaign he wished to support the conclusion enunciated in the paper. He regarded the first field-dressing as somewhat ineffectual either as an aseptic or antiseptic agent, and attributed the aseptic course of wounds rather to the nature of the wound and atmospheric conditions than to the dressing. Some better means of fixing the dressing should be devised.

[Surgeon General Harvey's observations on the advantages of the Dum-dum bullet in war with savage and fanatical foes were approved by the Section, and Surgeon General Hamilton's motion deprecating such bullets was not entertained.]

THE INFLUENCE OF COLOUR UPON ANOPHELES.

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IN PURSUING our Studies in Relation to Malaria, which are appearing in the *Journal of Hygiene*, my colleague, Mr. A. E. Shipley, and myself thought it desirable, amongst other things, to study the influence of colour upon *Anopheles maculipennis*. From what is known of the behaviour of other insects to colour, and occasional hints we have obtained from observing the behaviour of *Anopheles*, we had concluded that we might, as the result of our experiments, obtain results having a definite practical bearing.

It seemed to us to be a matter of considerable practical utility to determine what influence, if any, colour exerted upon a known malaria-bearing species of mosquito; and we deem our results sufficiently striking to make it worth the while for those who are engaged in similar studies abroad to take the matter up systematically. Our experiments certainly indicate that *Anopheles maculipennis* is attracted by some colours and repelled by others, a matter which would have its practical application in the choice of the colour of clothing and the interior of rooms in malarious districts.

The preference of *Anopheles* for dark and shady places, whither they retreat during the daytime, has been noticed by a number of observers. The behaviour of the insects towards various colours has not as yet received sufficient attention. Whilst engaged upon our experiments we came upon a few data cited in the recent literature.

Austin¹ writes: "If the walls of the room be whitewashed

with a dark dado, it is interesting to note that the insects will always be found upon the dark strips, and never on the white portions of the wall." Buchanan² in India noted that "the men who collect the living *Anopheles* say that the *Anopheles* hide in a black coat, but avoid a white coat, so they hang up one or two black coats in the hospital ward" when they desire to catch the imago. Neither Austin nor Buchanan say anything about the influence of colour. The first, as far as we know, to refer directly to the influence of colour is Joly³, who made observations on mosquitos in Madagascar. He states, without saying what genus, that "mosquitos" there were more attracted to black than to red soil or to white sand. Persons wearing black shoes and socks were more bitten than when these articles of apparel were white. Brown clothes protected less than those of white or blue. He states that the natives of Madagascar know the attraction black offers to mosquitos, and for this reason hang up a black cloth on the rafters of the room for the insects to collect upon. Joly observed that a yellow-haired dog was very much less bitten than a black one. For the same reason the natives are more bitten than the whites, although they suffer less from the after-effects.

Our experiments were made in a large gauze tent, which had been erected within a disused photographic establishment, the one end of the tent ending against large windows, into which the sunlight poured on bright days. Large stone basins were placed on the floor for the *Anopheles* to breed in, the stock being renewed from time to time.

It was noticed at the beginning that when one entered the tent in dark grey clothes the imagos frequently flew up and settled on the dark cloth, but that they never did this when the person entering the tent was clothed in white flannels. To test the influence of colour, a number of pasteboard boxes were taken which measured 20 cm. by 16 cm. and had a depth of 10 cm. The boxes were lined with cloth, having a slightly roughened surface, to which the insects could comfortably cling. All of the fabrics had a dull surface, and each box was lined with a cloth of different colour. The boxes

were placed in rows upon the floor, and upon each other in tiers, the order being changed each day after the observations had been made. The interior of the boxes was moderately illuminated by light reflected from the surface of the white tent. On seventeen days during a month, beginning with the middle of June, we counted the number of flies which had accumulated in the boxes. Counts were actually made on seventeen sunny and cloudy days, and with the following result:

Colour of Box	Number of <i>Anopheles maculipennis</i> Counted in each Box during Seventeen Days.	
Navy blue.....	108	
Dark red.....	90	
Brown (reddish).....	81	
Scarlet.....	59	
Black.....	49	
Slate grey.....	31	
Dark green (olive).....	24	
Violet.....	18	
Leaf green.....	17	
Blue.....	14	
Pearl grey.....	9	
Pale green.....	4	
Light blue (Forget-me-not).....	3	
Ochre.....	2	
White.....	2	
Orange.....	1	
Yellow.....	0	
		512

We see from the above table that dark blue was most attractive, the other colours being less and less attractive in the order of numbers given. A marked fall in the number of insects resting in the boxes begins with the "blue" box; the colour in this case was a rich full blue. Pale green, light blue, ochre, orange, and yellow, especially the last two colours, seemed to repel the insects.

The khaki uniform at present in vogue should therefore offer advantages besides being invisible to the human enemy. It is of course true that the *Anopheles* bite more frequently during twilight and at night, but the choice of clothing having a repellent colour should afford a measure of protection against the insects which may bite during the daytime. In any case, the number of insects congregating in dwellings

might very well be lessened by the choice of colours of a suitable character applied to the walls. It has also occurred to me that some sort of a trap might readily be devised, lined with a suitable colour, such as dark blue, within which the insects would congregate and easily be destroyed in considerable numbers. Our experiments with boxes have been so striking that such a plan immediately suggested itself. Unfortunately for the experiment we are not living in a country where *Anopheles* are numerous, so we will hope that those who are placed in more favourable circumstances will make the attempt to see if colours can be made to afford a practical means of protection.—*British Medical Journal*.

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Practitioner, March, 1901, p. 341. ²*Indian Medical Gazette*, April, 1901, p. 195. ³*Arch. de Parasitologie*, May, 1901, p. 259.



THE PHYSIOLOGY OF MARCHING.*

BY DR. ZUNTZ AND DR. SCHUMBERG.

A SERIES of important works dealing with medico-military subjects has recently been initiated in Germany by the issue of a volume on the physiology of marching by Drs. Zuntz and Schumberg. The authors utilized in the investigation of their subject six students, who were set to march in uniform, carrying the usual military accoutrements. It will be interesting to summarize the main observations and conclusions. With regard to the circulatory system, it was found that severe marching shortened diastole, lengthened systole, lessened the systolic expansion of the arteries, and increased dicrotism. Marching with a load of 18 kilos. lengthened the systolic time by 30 per cent., while a load of 31 kilos. lengthened it by 55 per cent. The prolongation of the systole was regarded by the authors as a sign of cardiac fatigue. The frequency of the heart beat was increased, and might reach 150. Tachycardia and prolongation of systole was accompanied by dilatation of the heart and congestion of the liver. An increase of the load from 22 to 31 kilos. markedly increased the enlargement of the heart and liver. In 50 per cent. of cases the left side of the heart was dilated as well as the right. The venous congestion and consequent enlargement were brought about partly by the pumping action of the skeletal muscles, partly by cardiac fatigue, but chiefly by fatigue of the respiratory pump. It was found that when the respiration was impeded by too heavy a load it became shallow and frequent. The vital capacity was strikingly diminished, in one case by 21

**Studien zur einer Physiologie des Marsches* (On the Physiology of Marching). Von Dr. Zuntz und Dr. Schumberg. Berlin: A. Hirschwald. 1901. (Demy 8vo, pp. 370. M. 8.)

per cent., and the average vital capacity without load was found to be 3,436 c.cm., with load 3,220 c.cm. The vital capacity was far more reduced in the raw recruit than in the trained soldier, and varied inversely as the frequency of respiration. Zuntz and Schumberg conclude that after a rest of a quarter of an hour the frequency of respiration should not exceed the normal by more than 30 per cent., during the march by more than 75 per cent. This is a practical test which can be applied by any officer. Shallow, quick respiration leads to venous congestion, and this in its turn leads to a rise of body temperature.

The temperature was measured in the urine. With a load of 22 kilos., and marches of 15 to 20 kilometres, the temperature even in tropical heat did not rise above 37° C. It was raised to 38° C. by a load of 31 kilos. and a march of 25 kilometres. After the debauch of a birthday celebration the temperature in one case reached 40.5° C.

The specific gravity of the blood was found to be raised, and the number of red corpuscles increased by 9 per cent., but these changes were, however, only temporary. The concentration of the blood is not due to sweating alone, for in the active muscles the osmotic pressure is raised by 50 per cent. The muscle fibres thus become turgid with water. The loss of water from the blood is counteracted by the withdrawal of tissue lymph into the circulation. This is brought about by vaso-dilatation and the pumping action of the contracting muscles. The number of polynuclear white corpuscles was found to be temporarily increased, but this was not due to new formations, and the conclusion drawn is that marching produces no permanent effect upon the blood of a normal man.

The specific gravity of the urine was found to be lowered, and owing to diuresis and to sweating the fluids of the tissues became more concentrated. Albumen and casts were observed after short, excessive muscular efforts, but never after severe marching. An increase noted in the output of calcium and phosphoric acid suggests the wear and tear of bone, for it was out of proportion to the output of nitrogen. There was no

increase in the output of ammonia. The increased output of nitrogen due to marching accounts for 6 to 7 per cent. of the total energy expended, and it was observed that very hot weather made the nitrogenous waste greater. If the muscular work be excessive the blood supply fails to keep up with the needs of the muscles, and destruction of muscular tissue then occurs and long-lasting lessening of functional power. Such is the result of over-training.

The soldiers were clothed in specially washed garments, and after the march the amount of nitrogen in these clothes was estimated. The authors calculated that as much as 12 per cent. of the nitrogen given off in the urine and faeces may be given off in the sweat during hard work (284 mg. N. per litre). Increases in the nitrogen output in the sweat seemed to be due rather to hot weather than an increased load. By remeasuring the respiratory output of carbon and water, and deducting the weight of the excreta from the total loss in bodily weight, the authors ingeniously reckon the output of sweat. For every 1,000 calories of energy expended in marching they reckon that about 800 grams of water are evaporated. The effect of atmospheric conditions, dryness, wind, sun, and the effect of load were investigated and calculated. A man weighing 70 kilos. produces, when resting, 1.2 to 1.35 calories a minute; while marching with a load of 31 kilos. he produces 7.73 calories a minute. The extra production of heat is calculated to raise the body 1° C. in 8.7 minutes, and yet the heat-regulating mechanism is found to be sufficient in spite of the uniform and accoutrements. A heavy load was found to increase sweating by impeding pulmonary ventilation. Zuntz and Schumberg argue that the heat regulation depends on the sweat glands, for they studied a man who possessed no sweat glands, and found that in a hot sun his temperature quickly rose to 39° C. in spite of a doubled pulmonary ventilation. They believe that soldiers with hot, dry, dark red skin and inactive sweat glands are especially in danger of heat-stroke.

The authors insist on the importance of substituting

light, porous clothing for the absurd uniform of the past. This by allowing rapid evaporation of sweat prevents overheating of the body by day, and over-cooling by night. They conclude there is no danger in long marches in very hot weather if the soldiers are lightly loaded. The load should not exceed 22 kilos.

The full war ration in Germany contains 181 grams proteid, 64 grams fat, and 558 grams carbohydrate, yielding 3,442 calories. A diet of the same calorie-worth was given by the authors, but they found that their subjects lost weight; they lost fat, but put on muscle. The subjects of their investigation were found to expend 3,600 calories on resting days and 4,300 on marching days. The German peace ration yields only 2,611 calories. They consider that the fat ought to be increased in the diet because it spares the work of digestion. They recommend also the use of more sugar, but are of the opinion that 110 grams of proteid in the diet is amply sufficient for nitrogenous metabolism. They point out that while 1 kilo. of adipose tissue yields 8,600 calories, the same weight of muscle yields 900 calories. Thus 7,700 calories (the energy of two days' work) are set free when a man replaces 1 kilo. of his adipose tissue by muscle. Such a substitution cannot, however, take place quickly, for 33 grams nitrogen, or 214 grams proteid, must be retained out of the diet to make 1 kilo. of muscle. With the growth of muscle the authors find a proportionate increase in oxygen intake. They ingeniously calculated the proportionate metabolism of fat and carbohydrate from their measurements of the oxygen intake, and the respiratory quotient. The proteid metabolism they reckoned in the usual way from the output of nitrogen.

They found that fatigue increased the rate of expenditure of energy, and that lameness due to pain in the tendons of the foot increased waste most strikingly. It would, they say, be uneconomical to work a lame horse on account of the amount it would eat! As a result of training there is more perfect co-ordination, fewer muscles are used, and work is done more economically; thus a riding horse carries a man

with markedly less expenditure of energy than a carriage horse. Excessive heat with a light load increases the expenditure of energy much more than a heavy load on a cold day. Loads increase expenditure in proportion to their weight, but if properly distributed over the body have remarkably little effect. The load should be placed so as to disturb the centre of gravity as little as possible, and should be so arranged on each side of the body as to balance the disturbance at one step by that at the next.—*British Medical Journal*, Aug. 10, 1901.

ASSISTANCE TO PRISONERS OF WAR BY RED CROSS SOCIETIES.

A PAPER upon this subject was presented by M. Romberg Nisard, at the Congress on *Œuvres d' Assistance en temps de Guerre*, held in connection with the Paris Exhibition of 1900. The late M. Romberg, father of M. Romberg Nisard, had been instrumental in founding during the Franco-German War the *Societe Internationale de Secours pour les Prisonniers de Guerre*, and he never lost an opportunity of keeping the subject before the public while he lived. On the outbreak of hostilities between the United States and Spain, he presented a memorial on the subject; and, again, on his own initiative, he submitted to the members of the Peace Conference at the Hague a proposal for international regulations dealing with prisoners of war, consisting of 20 articles. M. Romberg Nisard's paper was a recapitulation of the work accomplished by his father, along with some suggestions of his own based on recent events. There was considerable discussion on this paper. One speaker strongly objected to any societies being organized to assist prisoners because prisoners had no right to be prisoners, and because individuals likely to allow themselves to be captured would only be the more likely to do so if they knew that organized charitable societies would look after them. Further, Red Cross Societies would only bring themselves into discredit and under suspicion if they were organized to help prisoners of war. Another thought was that the funds subscribed to Red Cross Societies could not be diverted to any other purpose than aid to sick and wounded.

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Editorial Department.

NATIVE TROOPS FOR OUR COLONIAL POSSESSIONS

THE article on this subject was written in China several months before the outbreak of the Boxer Rebellion.

That unexpected event afforded a rare opportunity for attesting the allegiance of the Chinese Battalion and fully vindicated the claims I have advanced for the employment of native troops when officered by Englishmen or Americans. Let it not be forgotten that Liu Kung Tao, Lau Chau, and the old city of Wei Hei Wei, where the Chinese Battalion was recruited, are located in the Shan Tung Province, which was the very hot-bed of the Boxer uprising. The following is an extract from my journal, of a conversation with Colonel Bower in Tien Tsin on the 9th of March, 1901. Colonel Bower was at that time the Imperial Commissioner representing Great Britain in the government in Tien Tsin. Replying to my question regarding the Battalion he said :

"No, there were practically no desertions from the Battalion although the men were subjected to terrible temptations. You know in China, parental love, Fung Shui, and ancestral worship are held as sacred tenets. When the Boxer movement was in its incipiency the families, priests and friends of my men resorted to every persuasion and threat to induce them to desert but without success. Finally they organized an attack and placed the fathers of my men in their front ranks, so that, should the men shoot, they would become parricides—guilty of the most heinous crime known in the Orient. But in the fight that followed, they cut their way through the two thousand attacking Boxer rabble, killed many, and routed the remainder to the hills. Encouraged by this evidence of loyalty I took two of my three companies to Taku and joined General Seymour's column in its advance on Tien Tsin. In the fighting that followed from June 20th to July 14th the men did excellent work, losing in action twenty-six killed and fifty-six

wounded. One officer was killed and two severely wounded. Fearing trouble, I ordered roll call every hour after reaching Tien Tsin. Two men were supposed to have deserted, but later investigations showed that one had been taken prisoner and the other was killed. The most remarkable thing that happened was with the company left at Wei Hei Wei. These men were so chagrined and disappointed at being left behind, and so determined to participate in the fighting, that almost the entire command deserted, and fought their way through nearly fifty miles of hostile country to join their companions at Tien Tsin, where I kept them until active hostilities ceased. On returning to Wei Hei Wei, I shall renew recruiting and expect to largely increase the number of our Chinese force."

All the troops employed by Great Britain in the China Relief Expedition were Indian, most of them Gurkas, Sikhs, Beluchis, and Royal Bengal Lancers. Colonel Shone who has long been an officer of the Royal Engineers in the Imperial Army of India said to me:

"It would be quite impossible to maintain order in India without the employment of natives who can endure conditions in the tropics which would soon annihilate white troops. England has found it advisable to keep an army of 75,000 British troops; with 150,000 natives for her protection there. Too many of one tribe should not be employed in one locality; at least one-third should be white troops. Had this precaution been observed there never would have been a Sepoy rebellion or an Indian mutiny."

In the report of Adjutant General Corbin, published today, it is asserted, that if it is decided that General Chaffee's force shall not be reduced, 20,000 new recruits will be necessary to replace those leaving the Philippines through expiration of time of service, between now and July, 1902. As re-enlistments in the American Army are now comparatively rare, owing to the abolition of the Canteen and the hardships of tropical service, this force must practically be drawn from new blood, recruits, none of whom have been acclimated to tropical conditions. As the figures given in the Adjutant General's report show that in the Philippines about five men die from disease for one who falls in battle, and that the cas-

ualties there have already amounted to 3493, to say nothing of the enormous number invalided home to swell the pension rolls, it remains to be seen how much longer the American people will submit to this unnecessary waste of our home material when native force can be equally well substituted.

New York, Oct. 18, 1901.

LOUIS L. SEAMAN.

MEDICO MILITARY NOTES.

THE ARMY HOSPITAL CORPS AND THE PRESIDENT.—The Hospital Corps detachment on duty at the exhibit of the Army Medical Department at the Pan American Exhibition furnished all the male nurses connected with the case of the late President at Buffalo.

THE AMERICAN PUBLIC HEALTH ASSOCIATION AND THE POST EXCHANGE.—Resolutions favoring the restoration of the canteen feature of the Post Exchange were passed with but a single dissenting vote by the American Public Health Association at its recent session in Buffalo.

THE ARMY MEDICAL DEPARTMENT EXHIBIT AT THE PAN AMERICAN EXPOSITION.—The military medical exhibit under the direction of Captain Edward L. Munson of the army has proven to be one of the most popular features of the Pan American Exposition, as many as two thousand persons having witnessed the drills and viewed the exhibits in a single day.

THE UNITED STATES ARMY MEDICAL FIELD EQUIPMENT ABROAD.—Canada has officially adopted the new United States Army ambulance and the Munson ventilated hospital tent. The regulation litter has been officially adopted by the Mexican Army. Samples of the ambulance have been ordered by England, France, Spain, Chile, and Mexico. The Medical Department of the British Army has recently purchased complete sample sets of the United States Army medical, surgical, sterilizing, and detached service chests, folding field furniture, bath tubs, and brigade hospital mess chest on the recommendation of the British military attaché in Washington, who considered them superior to their own equipment.

In Memoriam.

President William McKinley,

Commander-in-Chief of the Army and Navy of the
United States of America.

Born in Niles, Ohio, January 29, 1843.

Died in Buffalo, N. Y., September 14, 1901.

VICTIM of the treacherous blow of an assassin, William McKinley, twenty-fifth President and Commander-in-Chief of the military and naval forces of the United States of America has passed away in the fulness of his powers, in the heyday of his achievements and in the plenitude of a people's love and affection. Assuming the chief magistracy at a critical period in the Nation's history, he guided the affairs of state so wisely and so skillfully that the republic emerged from a great international conflict, not only victorious in a war undertaken from the purest of motives, but with a newly confirmed national unity and a fixed position among the great powers of the world. Broad in mind, discriminating in observation and sympathetic in character, his temperament ever maintained an appreciative attitude toward the healing art both in peace and in war. He held his own physician by the closest ties of friendship and regarded the entire profession with generous and kindly interest. A soldier while hardly more than a boy, he knew, as do few, the difficulties, hardships and discouragements of the military surgeon. His generous qualities were never suppressed nor superseded. With intellectual attainments of the highest order, he possessed a masterly grasp of practical affairs, constituting a combination as rare as it was admirable. In his untimely decease the Country has suffered not only an irreparable national bereavement, but a distinct loss in personal character, although it has gained a splendid memory which will ever gild with the glow of kindness, intelligence, energy and strength the period of national existence moulded by his hand.

Reviews of Books.

MILITARY HYGIENE.*

THE Military Service is to be felicitated upon the production of so comprehensive and exact a work as Captain Munson's *Theory and Practice of Military Hygiene*. Hammond's compilation for the medical officers of the war of the Rebellion, Woodhull's manual for the instruction of the student officers of the Fort Leavenworth Infantry and Cavalry School, and the masterly chapters of Smart in Ziemssen's Cyclopedie and in the Reference Handbook of Medical Science, together with the various monographs pertaining to the subject in the Proceedings of the Association of Military Surgeons of the United States, have hitherto practically comprised the American literature of military hygiene. And the work of Parkes, an officer of the British medical service, has for a third of a century been the ultimate authority in the United States army, the various revisions by the author and by other authorities having easily maintained it in the lead in the contest for scientific precedence. It is interesting to learn that the United States is now reciprocating in this respect, Munson's work having been adopted as the official standard by the British army in India and supplied in large numbers to the English forces at home and in South Africa.

Taking the soldier at the beginning of his military existence, Captain Munson thoroughly canvasses the selection and development of the recruit. Personal hygiene is minutely considered in chapters on the soldier's cleanliness, food, clothing, habits, marching, and diseases, very appropriately concluding

**The Theory and Practice of Military Hygiene*. By EDWARD L. MUNSON, A.M., M.D., Captain, Medical Department, U. S. Army. Imp. 8vo, pp xii, 971. New York, William Wood & Co. 1901.

with an authoritative series of observations on the disposal of his remains.

Temporary collection in camps and troopships and permanent massing in barracks, quarters and hospitals receive conspicuous attention,—ventilation, heating, lighting, disinfection, and disposal of waste being appropriately considered in connection with each. Climatic conditions are discussed with ample references to the extremes of heat and cold, and the work concludes with a most suggestive and instructive chapter on military sanitary inspection, a feature of the work of the military surgeon which too often fails to receive the proper attention on the part of the medical officer and even more rarely meets with proper recognition on the part of him of the line.

In connection with the examination of the recruits the most recently accepted methods are described in such detail as to supersede the necessity for a special manual upon the subject, particular prominence being given to the work of Greenleaf. Of exceptional value is the discussion on military physical training found in the chapter on the development of the recruit, although the title may convey the impression that physical training should be confined to the recruit, whereas it should of course be continued until age has produced such degenerations as may render exertion dangerous. The writer is pleased to see that Captain Munson has adopted his translation of Hohenlohe's description of the German recruits before development by systematic exercise, and his division of physical training into two classes. Careful distinction is made between physical culture and competitive athletics, and the danger of overtraining is strongly emphasized. Equitation, natation and applied gymnastics are fully and clearly discussed, and the mental and moral hygiene of the soldier is not forgotten.

The discussion of the march in campaign is especially timely and up to date. Attention is called to the artificial nature of our step of 30 inches and the greater propriety of the German step of 31.2 inches, and the care of the feet is properly emphasized.

The chapter on water is particularly satisfactory and essentially practical. Microscopical and bacteriological examination is fully considered and the subject of purification is amply presented. The Forbes water sterilizer is described in detail and various extemporized procedures are illustrated, while the Maignen and Berkefeld apparatus receive ample attention.

The 137 pages devoted to the ration form a complete exposition of the subject of food from the soldier's standpoint, such as would be expected from the successful competitor for the Seaman prize for the best essay on "the ideal ration for an army in the tropics."* The author concludes that "the United States army ration is somewhat more than sufficient to meet all the demands of active muscular labor in a temperate climate", that it "is in excess of the physiological needs of the soldier in tropical service, but, on the other hand, it is undoubtedly insufficient for service in the far north", and remarks that, "bearing in mind that in tropical countries carbohydrates form the staple, while a mixed dietary is used in temperate climates, and fuel-foods, or fats, are required under cold temperatures,—the diet of troops should be suitably modified in these respects according to their geographical distribution." He recommends variety in cooking as a means of avoiding sameness in diet, and very properly steers clear of the post exchange discussion. He illustrates the Buzzacott cooking outfit for field use, but does not mention the "Dutch oven", so dear to the old campaigner, of which the Buzzacott is an evolution. His discussion of the individual articles of diet is encyclopedic, while the section on emergency or reserve rations is of especial value at the present time.

In the chapter on clothing and equipment, the present blanket-bag is condemned as "the most vicious article of the equipment of the United States soldier," an opinion which will be heartily endorsed by every experienced officer. He suggests the Merriam pack, the valise of the British foot serv-

*See Proceedings of the Association of Military Surgeons of the United States, vol. ix, p 298.

ice or the Novior knapsack as a substitute. He does not consider well-founded the objections to the use of aluminum in the construction of the soldier's mess outfit.

It is difficult to resist the temptation to override the limitations of space and consider in detail the instructive, scholarly and practical chapters on "Camp sites and Camps," "Posts, Barracks and Quarters," "Ventilation" and "Disinfection," "Heating and Lighting," "Military Mortality and Morbidity" and other subjects; it would be difficult to do them justice in any case.

The chapters, however, on the "Personal cleanliness of the Soldier" and the "Habits of the Soldier," demand especial mention, because of their broad teachings and logical method, while the absolutely modern attitude of the author toward the "Diseases of the Soldier" renders his chapter on that subject of genuine value to the reader.

The work forms a large book, and it is fortunate that the author did not yield to the tendency to separation and make two volumes of it. The multiplication of articles is a serious bar to usefulness, especially in the confusion inherent in field service. And large as the book is, not a word could well be omitted, and it thoroughly deserves the recognition it has received not only in the medical departments of our own and foreign armies, but also by officers of the line and other staff corps for the use of whom a large edition has been distributed by the Secretary of War to posts, transports and regimental headquarters. All departments are to be congratulated upon the possession of so practical an aid to the sanitary administration of the service.

JAMES EVELYN PILCHER.

A CIVILIAN WAR HOSPITAL.*

THIS BOOK, based upon the workings of an auxiliary tent hospital attached to the British forces in South Africa, though supported by private subscriptions and operated by civilians, is clearly written and attractively

*A Civilian War Hospital. By the Professional Staff, ANTHONY A. BOWLY, HOWARD H. TOOTH, AND OTHERS. 8 vo. pp. 8-327. New York, Longmans, Green & Co., 1901.

got up. The subject matter deals with the organization and equipment of such a hospital of 160 beds capacity and contains, also, the conclusions reached by the attending staff relative to the camp diseases and gunshot wounds with which their service in the field brought them in professional contact.

Beginning with the chapter on equipment of the hospital, the reader is forcibly impressed with the fact that in the matter of equipment for field hospitals, the Medical Department of the United States Army, as at present outfitted for the field, has nothing whatever to learn from the British Medical Service, on the lines of which this hospital was organized. The weight of this hospital for 160 patients amounted to no less than 70 tons, where the U.S. Army hospital of 100 beds weighs not more than one-seventh as much—the latter being transported in half a dozen army wagons while the field hospital in question needed a railroad train of some fourteen cars to move it. If similar conditions prevailed throughout the British Army, its inability to leave the railroad, wage an aggressive warfare or cope with a mobile enemy is readily explained. The cots used in this hospital weighed 60 pounds each, while those used in our own field hospitals weigh but 17 pounds each. Glass and china table ware were also carried with this hospital, and there are many other evidences of the retention of heavy, cumbrous and fragile articles of a character long since discarded in our own service. The ambulances pictured and described as used with this hospital appear more like heavy wains than the light, capacious and substantial vehicles used for the transportation of wounded in our own service. The deficiencies of the British ambulance are however fully admitted by the writers, who say: "We do not know of any good ambulance wagons that are purchasable in this country, and those that we took out ourselves left much to be desired." It may here be remarked parenthetically that the British Government has recently purchased a number of U. S. army ambulances for use in South Africa, and has also ordered samples of our entire field hospital equipment for trial.

The chapters on the diseases encountered of course deal chiefly with typhoid fever and dysentery, but they are not sufficiently full to be of the greatest scientific or practical value. The outbreaks of typhoid fever described are almost identical in their origination, course and severity with those prevailing in our own camps in 1898. Dr. Tooth, who writes up the medical side of the service, gives the first place in importance to typhoid fever, "without which scourge it must be remembered that the medical casualties of the campaign would have been comparatively insignificant." He regards the dissemination of typhoid infection among troops as due to bad water, infected flies and dust and to personal contact with the sick. He disproves his own first point, however, by showing that there was a higher rate of typhoid among the officers, who usually took care to drink only boiled water, than among the men, who would not be restrained from using doubtful sources of supply. Further, at Bloemfontein, as was the case with our own troops at Jacksonville and Lexington in the camps of 1898, typhoid raged among the British soldiers while it was no more severe than usual among the civilians of the adjoining town. The great importance of flies as carriers of infection was noted, and a curious preference on the part of flies to congregate around typhoid cases rather than other sick in the same ward is commented upon. Epidemics of typhoid were seen to cease abruptly with frost and the death of the flies, which, as the inhabitants of Bloemfontein said, "came with the army". As the fly plague largely depends upon the presence of filth, it is probable that no very efficient sanitary police existed in the camps. In speaking of the Modder River campaign, Dr. Tooth says: "It would appear in the present state of knowledge to be almost impossible to combat hygienically the spread of enteric fever in any army under similar conditions." This was, however, accomplished in our own army in several instances in 1898, as at Camp Meade. Dr. Tooth justly remarks: "It is quite unjustifiable to allow any man to return to duty which involves camp life after an attack of enteric fever, however slight, except after

a long interval, the extent of which has yet to be determined." Undoubtedly much typhoid fever was spread among our own troops in 1898 by the return to duty of convalescents who still harbored the germs of disease in their alimentary or urinary tracts. The authors are much impressed with the value of anti-typhoid inoculations, which their statistics go to show not only reduced the incidence of the disease but also diminished its severity when once contracted. It is thought that the amount of reaction following inoculation is a reliable indication of individual susceptibility, and repeated reinoculation is favored until no reaction is obtained. Many cases of fulminant typhoid were seen, and where such cases recovered, convalescence was unusually protracted. A rapid pulse gave an unfavorable prognosis, and diarrhoea was also regarded as an unfavorable symptom and treated where there were more than three movements daily. Many more cases died in which diarrhoeal symptoms were prominent than did those in which there was a tendency to constipation. The mortality among the typhoid cases treated amounted to 12.5 per cent.

The chapters treating of gunshot injuries are very interesting and contain much valuable information. They contain a short discussion on the subject of ballistics, projectiles and their effects, and are very fully illustrated with excellent radiographs. The X rays were apparently used as a matter of routine on all cases of gunshot injuries involving bone, and the authors are very enthusiastic as to their value in military surgery. They dispose summarily of the popular charge that the Boers used poisoned bullets, but at the same time show that the latter at times used "dum-dum" or mushrooming bullets, and illustrate the mangling effects produced by the latter. Like nearly all military surgeons with actual experience on the battle field, they are very skeptical as to the hard and fast rules of "explosive action" attributed to the full mantled bullet, within certain ranges, by experimental investigators. On page 117 they say: "It may be said in general terms that the actual experience of gunshot fractures in war does not confirm the very definite conclusions arrived at as a result of

experiment in times of peace, so that although much has been learned, it was soon evident that there was yet a good deal more to learn on this subject and that there had been a tendency to be too dogmatic as to the effect of high velocity projectiles." Again they say on page 180: "There are many factors to consider in determining the nature of a gunshot fracture, and no mere consideration of the bullet or the range is sufficient for a proper appreciation of the results observed." They place the chief factors in determining the character of gunshot wounds, in order of importance, as follows: (1) range, (2) character of bone, (3) angle at which the bone was struck. As a result of their experience, the authors conclude that bone injuries are liable to present the appearance of "explosive action" at any range, while wounds of tissue not involving bone rarely show any "explosive action," even at the shortest range. "We do not think that the range, or what is the same, the velocity, has any appreciable effect when soft parts alone are wounded. * * * When, on the other hand, bone is struck, and a good resistance is offered to the onward passage of the projectile, the velocity becomes an important factor, and the higher the velocity the greater is the damage and splintering done to the bone" (page 164).

Wounds with lodged bullets appeared to heal as kindly as if the missile had passed out. The good results obtained with bullet wounds were believed by them to be due (1) to the small wound produced by the Mauser, (2) favorable climatic conditions and (3) early antiseptic dressing. These views differ from those of our own army surgeons, who regard the antiseptic dressing as of by far the greatest importance. With regard to the enlargement of wounds for the removal of bone fragments, the authors believe that the character of the external wound furnishes a safe guide. If the wound opening is large, the bone fragments should be removed, but if the external wound is small, such removal is not usually required. Fragments of bone attached to the shaft should not be removed, as experience shows that these do not ordinarily necrose. The authors never performed or advised amputation

for an uncomplicated bullet wound, and state that the assumption of this position never subsequently caused regret. Joint injuries caused no trouble aside from that due to bone comminution, and these injuries were habitually treated like simple flesh wounds. Excision of joints is regarded by them as an operation of the past and as no longer indicated. There seemed to be no increased danger from haemorrhage in Mauser wounds, and they state that death on the battlefield from haemorrhage from wounds of the limbs rarely occurred in South Africa. Traumatic aneurism, however, gave rise to much difficulty, and ligation was followed unexpectedly often by gangrene. With regard to wounds of the skull, the authors say on page 220: "It may be stated here that the expected disruptive effects of the perfect Mauser bullet have not been seen. * * * In cases of bullet wound of the skull at ranges observed in this war, practical experience has not borne out the deductions of experiment." Wounds of the lung usually made good recoveries, but such cases do not bear rough handling and transportation without ill effects. Laparotomy has saved but few soldiers and must be regarded as among the unsuccessful operations in field surgery. The point is emphasized however, that wounds affecting the peritoneal cavity do not necessarily imply perforation of the intestine, and that a number of cases of supposed injury of the intestines which recover without operation very probably belong to this class. A number of cases are given to illustrate this point. Wounds of the large intestine are much more liable to recover without operation than are wounds of the small intestine. While the general opinion of military surgeons in South Africa was to the effect that 20 per cent of wounds of the intestine recovered without operation the authors were inclined to regard this estimate as too high, and call attention to the fact that injuries of the intestine should be studied as to their fatality rather on the firing line than in the hospital.

On the whole, there is much to commend in this book, which, though apparently written for the lay as well as the professional reader and neither suited nor intended to serve

as a text book, nevertheless contains much valuable information and is well worthy of careful perusal by the military surgeon. The large number of unusually good photographs and radiographs in the book add much to its value and attractiveness.

EDWARD L. MUNSON.

THE BRITISH ARMY MEDICAL SERVICE, 1899.*

THE interesting record of the work of the Medical Department of the British Army for 1899, is of the highest value to the military surgeon, covering statistics of service in all quarters of the globe, with special reports upon the health of the troops serving under all climatic conditions. In addition to the report proper, fourteen professional appendixes are presented, bringing the work down to a more recent date than appears in the title. Major Horrocks of the Army Medical School at Netley contributes a comprehensive report on the progress of hygiene for the year 1900; Majors Dick and Birt of the same institution present a report on the operative work, and Colonel McLeod reports upon the medical service of the Royal Victoria Hospital at Netley; most valuable reports are made by Major Macpherson on the international congress of "œuvres d'assistance en temps de guerre" of 1900, on the organization and resources of voluntary aid in France, and on the Russian army medical service exhibits at the Paris Exposition; an opportunity to "see oursels as ithers see us" is afforded by the complete and appreciative reports of Colonel McWatters on the eighth and ninth annual meetings of the Association of Military Surgeons of the United States; in addition to the proceedings of the meetings proper, Colonel McWatters presents a full description of the "Oliver Collecting Stretcher" suggested by the "Pettee Emergency Carrier" shown at Kansas City, but not mentioned in the Proceedings; he also illustrates the Mahan carrier described by Medical Inspector Gravatt but not illustrated in the Proceedings.

JAMES EVELYN PILCHER.

**Army Medical Department Report for the year 1899, with Appendix.*
Vol. 61. 8vo, pp. 517. London, 1901.

THE MILITARY BOARDS OF HEALTH AND OF CHARITIES IN PORTO RICO.*

THE conquest of the Spanish dependencies by the United States military forces involved much more than the mere transfer of the reins of government from one nation to another. It was rather an entire transformation in the conduct of life. The conquest of Britain by the Normans was mild in its modifications of the habits and customs of the subject people as compared with the sanitary changes consequent upon the American occupation of our new dependencies. The rehabilitation of Porto Rico by the health board established and maintained under the military government is a conspicuous instance of the varied duties which fell to the care of the military surgeons upon the assumption of American sovereignty over Spanish colonies. The Superior Board of Health, established upon the recommendation of the chief surgeon of the forces of occupation, Lieut. Col. John Van R. Hoff, U. S. Army, consisted of that officer as President, Surgeon Arthur H. Glennan, U.S.M.H.S., Surgeon F. W. F. Wieber, U.S.N., Major George G. Groff, U.S.V., Dr. Gabriel Ferrer and Dr. Ricardo Hernandez, the last two gentlemen being local physicians of recognized professional acquirements. This body set to work systematically to establish a system of sanitation which should reduce the sick rate and mortality of the island. The many problems which presented themselves were promptly solved as they arose. The stupendous task of vaccinating the entire population with lymph from its own vaccine station was undertaken and successfully accomplished, and measures provided for the continued immunization of the people, as will be shown by a special report on the subject to be published in the next number of this Journal. It licensed the entire medical personnel of the island, and placed itself in touch with those upon whom it must depend in case of an epidemic. It organized a local board of health in every municipality and provid-

*Epitome of Reports of: I. The Superior Board of Health, II. The Board of Charities of Porto Rico, under the Military Government. Appendices to the Report of the Military Governor. By Major John Van R. Hoff, President of both Boards. 8vo: pp. 359: Washington, Government Printing Office, 1901.

ed regulations for the government of such bodies. It established a hygienic laboratory and promulgated stringent regulations relative to the purity and wholesomeness of foods and medicines, requiring the formulas of all proprietary and patent medicines to be registered in the office of the board. It prepared and promulgated an important series of sanitary regulations, published in thirteen circulars and covering the subjects of pure foods, the practice of medicine and pharmacy, nuisances, interior quarantine, the control of cemeteries, vital statistics, contagious diseases of animals, etc., all of which are presented in full in this report. In fact, no phase of the erection of a healthful situation upon the wreck of an effete and disease-ridden administration was neglected, and the work of this board forms the most brilliant chapter in the splendid history of the American rejuvenescence of a degenerated people.

Another function, neither medical nor military, but especially allied to the former has fallen to the lot of officers of the medical department. The work of Colonel Hoff, as President of the Board of Charities in Porto Rico and of Colonel Kean as Superintendent of the Department of Charities in Cuba will live as distinguished examples of the adaptation of the military surgeon to genuine altruism. The work in Porto Rico, inaugurated upon the recommendation of Colonel Hoff, was administered by an officially detailed Board of Charities consisting of himself as president, and Surgeon Wieber of the Navy, Captains Wells and Reynold and Contract Surgeon Cowper of the Army, Dr. del Valles, Father Nin and Chaplain Brown. The immediate cause of the formation of this board was the great destitution consequent upon the hurricane of August 8, 1899. The board was tireless in its work. It received and distributed over thirty-two million pounds of food, and many thousand garments. Its administration of this distribution was so wisely managed that in return for the food and clothing donated it secured the clearing and return to cultivation of all the coffee plantations in Porto Rico ; it built or repaired numerous trails leading in every direction through

the mountainous regions of the island; it cleaned the towns, rebuilt hundreds of houses and was limited in its work of reconstruction only by the lack of implements to put into the hands of tens of thousands of persons who were glad to contribute freely of the labor of their hands in return for the aid rendered to them. The amount of means at the disposal of the board was infinitely below the needs of the emergency, but the freely tendered services of American officers and the singular judgement with which it was administered renders the solution of this problem uniquely successful. To the execution of another important function, the board brought the same intelligent interest and energy,—the supervision of the insular charitable institutions. It enlarged the accommodations for orphan children and reorganized and improved its management. It expanded, developed and modernized the insane asylum, placing it upon a scientific and business foundation. It planned the organization of a leper colony at Punta Salinas, and urged the complete isolation there of all Porto Rican victims of the disease, meantime caring for a number already but inadequately housed at Puerta de Tierra. It proposed the establishment of a house of correction for youthful incorrigibles, and met a host of emergencies which constantly arose in the management of the varied interests which came under its supervision. The picture of the deeds of this body ought to be laid before every citizen of the republic, as an object lesson in civic administration and an example of the unpaid labors of those men upon whom a country is all too apt to look with unappreciative and ungrateful eye.

JAMES EVELYN PILCHER.

WEBSTER'S INTERNATIONAL DICTIONARY.*

IN its successive editions, the original dictionary of Noah Webster, has continuously adapted itself to the times and to the state of development of a tongue which is so essentially living that hardly a day passes without the birth of

**Webster's International Dictionary*, with a Supplement of twenty-five thousand words and phrases. W. T. Harris, LL.D., Editor-in-chief. 4 to., pp. 2364, Springfield, Mass., G. & C. Merriam Co., 1901.

a word. Recent investigations as to the number of words used in conversation by various classes of individuals have shown that the old fables as to the limited vocabulary of colloquial man were quite unfounded. An authoritative work like Webster, in a single volume, and readily consulted is a necessity of the times. It is a *vade mecum*, with which the scholar can not dispense, be he ever so rich in professional or technical dictionaries. The military portion in the present edition has been supplied by Professor Fiebiger of West Point, while the medical additions have been made by Lieut. Col. Billings, of the retired list of the army. The new words and new definitions are many and unexceptionable. A glance through the supplement reveals such additions as "Aden ulcer," "agar agar," "ainhum," "autopathic," "appendicectomy" and "appendectomy," "Boxer," "cyesis," "desmosis," "electrovection," "ethmoiditis," "fungate," "gliosis" and "gliomatous," "haematokrit," "hike," "hypnogenesis," "jugulation," "Koch's lymph," "kopje," "laryngectomy," "meningococcus," "myeloma," "necrotomy," "nicotism," "orders" of knighthood, nobility and merit, "paralgesia," "periostosis," "polyneuritis," "risus sardonicus," "sapphism," and "thanatophobia." "Ordnance department" of the army, and "signal corps" are fully defined but we fail to find "medical department" and "hospital corps," which should with equal reason be added. We do not find the phrase "first aid," which has attained so wide an acceptation and so distinctive a meaning as to entitle it to consideration in another supplement.

JAMES EVELYN PILCHER.

THE ARMY MEDICAL DEPARTMENT IN 1900-1901.

THE REPORT of the Surgeon General of the United States Army for the fiscal year 1900-1901 is of particular interest as being the last report of the scholarly, energetic and progressive officer, whose retirement next June will be the source of genuine regret upon the part of the entire service and no less upon the part of this Association to the development of which he has so materially contributed.

THE REPORT OF THE SURGEON GENERAL OF THE ARMY FOR THE FISCAL YEAR ENDED JUNE 30, 1901.

In submitting a report of the administration of the duties of this office during the past year, I have the honor, first, to invite attention to the financial transactions for the year ended June 30, 1901:

FINANCIAL STATEMENT, 1901.*

Medical and Hospital Department, 1901.

Appropriated by act approved May 26, 1900.....	\$2,000,000.00
Transferred from appropriation "Medical and hospital department, 1899," by act approved	
March 3, 1901	150,000.00
Sale to Quartermaster's Department	70.00
Refunded during the year (including transfer settlements by Treasury Department to adjust appropriations \$45,957.94).....	46,234.20
	46,304.20
Total to be accounted for	<u>\$2,196,304.20</u>

Disbursed during the year:

Expenses of medical supply depots	563.32
Medical supplies.....	1,519,717.50
Medical attendance and medicines.....	12,088.26
Medical expenses of recruiting	37,825.95
Pay of nurses	83,245.09
Pay of other employees.....	141,903.87
Washing of hospital linen.....	57,775.28
Miscellaneous (notary fees, exchange and expressage)	90.48
	<u>1,853,269.75</u>

*. The disbursements in this statement include settlements with public creditors made by the accounting officers of the Treasury and charged by them to these appropriations.

Transferred by Treasury settlement to adjust appropriations..... 2.67

Balances on hand June 30, 1901:

In United States Treasury and in transit thereto 200,340.00

In hands of disbursing officers:

Washington.....	8,514.06
St. Louis.....	19,642.45
San Francisco.....	34,472.85
St. Michael, Alaska.....	3,521.35
Havana, Cuba.....	458.89
Tientsin, China (Peking relief expedition)	2,817.25
Nagasaki, Japan (Peking relief expedition)....	1,631.97
Manila, P. I.....	68,093.10
Aparri, P. I.....	294.74
Iloilo, P. I.....	240.56
Vigan, P. I.....	4.56
Total accounted for.....	343,031.78

Total accounted for..... 2,196,304.20

Medical and Hospital Department, 1900.

Balances on hand July 1, 1900*, acts of March 3, 1899 and February 9, 1900.....	\$445,463.89
Refunded during the year (including transfer settle- ments by Treasury Department to adjust appropria- tions \$526.62.).....	2,646.40
Total to be accounted for.....	448,110.29

Disbursed during the year:†

Expenses of medical supply depots.....	\$ 100.94
Medical supplies.....	142,908.00
Medical attendance and medicines.....	2,898.25
Medical expenses of recruiting.....	2,821.65
Pay of nurses.....	9,506.76
Pay of other employees.....	3,760.19
Washing of hospital linen.....	8,232.52
Miscellaneous (notary fees and exchange)	286.42
	170,523.73

Transferred by Treasury settlements to adjust ap-
propriations..... 167,364.28

Balances on hand June 30, 1901:

In United States Treasury..... 105,403.81

In hands of disbursing officers:

Washington.....	4,117.82
San Francisco.....	700.65
Total accounted for.....	448,110.29

* Including balance at Cebu, P. I., June 1, 1900, the June account from that station not having been received at date of last annual report.

† Including disbursements at Cebu, P. I., during June, 1900, not previously reported.
See preceding note.

Medical and Hospital Department, 1899.

Balances on hand July 1, 1900, acts of March 15, 1898,	
January 5, 1899 and March 3, 1899.....	385,081.70
Refunded during the year (including transfer settle- ments by Treasury Department to adjust appro- priations \$123,015.23)	\$123,079.64
Erroneous deposit on account of board of officer in hospital.....	24.00 123,103.64
Total to be accounted for	<u>506,185.34</u>

Disbursed during the year:

Medical supplies.....	1,677.87
Medical attendance and medicines.....	3,764.83
Medical expenses of recruiting.....	114.60
Pay of nurses.....	1,544.51
Pay of other employees,.....	224.13
Washing of hospital linen.....	297.30
Exchange.....	519.39 8,142.63

Treasury settlement to cancel erroneous deposit on ac- count of board of officer in hospital.....	24.00
Transferred to appropriation "Medical and hospital de- partment, 1901" by act approved March 3, 1901,.....	150,000.00
Transfer to surplus fund.....	<u>350,018.71</u>
Total accounted for	<u>508,185.34</u>

Medical and Hospital Department, January 1, 1899.

Balances on hand July 1, 1900, acts of May 4, 1898, June 8, 1898, and July 7, 1898.....	826,521.24
Refunded during the year.....	10.29
Total to be accounted for	<u>26,531.53</u>

Disbursed during the year

Medical supplies.....	\$ 952.45
Medical attendance.....	341.29
Medical expenses of recruiting.....	32.40
Pay of nurses.....	3.25
Transferred to surplus fund	\$ 1,329.39
Total accounted for	<u>25,202.14</u>
	<u>26,531.53</u>

Medical and Hospital Department, Certified Claims.

Appropriated by act approved March 3, 1901	\$ 8.50
Disbursed during the year.....	<u>8.50</u>

Appropriation for National Defense, Act of March 9, 1898.

Allotment by the President April 16, 1898:

Balance on hand July 1, 1900	\$ 5.51
Amount not drawn from Treasury, no longer available, dropped to close account on books of this office	<u>5.51</u>

Reallotment by the President September 8, 1898:

Balance on hand July 1, 1900	\$ 1,592.59
Amount not drawn from Treasury, no longer available, dropped to close account on books of this office	<u>1,592.59</u>

Allotment by the President October 6, 1898:

Balance on hand July 1, 1900	\$24,124.63
Refunded during the year.....	<u>99.85</u>
Total to be accounted for.....	<u>24,224.48</u>

Disbursed during the year:

Medical attendance	\$ 213.15
Medical expenses of recruiting	88.40
Amount not drawn from Treasury, no longer available, dropped to close account on books of this office	<u>\$ 301.55</u>
.....	<u>23,922.93</u>
Total accounted for	<u>24,224.48</u>

Allotment by the President November 22, 1898:

Balances on hand July 1, 1900	\$21,481.68
.....	<u>.....</u>

Disbursed during the year:

Medical supplies	\$ 12.50
Medical attendance	528.00
Medical expenses of recruiting	421.40
Washing of hospital linen	<u>12.50</u>
.....	<u>\$974.40</u>

Amount not drawn from Treasury, no longer available, dropped to close account on books of this office	<u>20,507.28</u>
.....	<u>.....</u>

Total accounted for	<u>\$21,481.68</u>
.....	<u>.....</u>

Reimbursement to Contract Nurses, (Traveling Expenses.)

Appropriated by act approved June 6, 1900	\$4,000.00
.....	<u>.....</u>

Disbursed during the year.....	677.44
Balance in United States Treasury June 30, 1901.....	<u>3,322.56</u>

Total accounted for.....	<u>\$4,000.00</u>
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Artificial Limbs, 1901.

Appropriated by act approved June 6, 1900.....	\$173,000.00
Disbursed during the year.....	<u>156,814.61</u>

Balance on hand June 30, 1901.....	<u>\$16,185.39</u>
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Artificial Limbs, 1900.

Balance July 1, 1900, act of March 3, 1899.....	\$43,302.05
Disbursed during the year.....	<u>6,968.05</u>

Balance on hand June 30, 1901.....	<u>36,334.00</u>
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Artificial Limbs, 1899.

Balance July 1, 1900, act of July 1, 1898.....	0.00
Refunded during the year.....	<u>50.00</u>

Total to be accounted for.....	<u>50.00</u>
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Disbursed during the year.....	\$ 45.32
Balance on hand June 30, 1901.....	<u>4.68</u>

Total accounted for.....	<u>50.00</u>
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Artificial Limbs, Certified Claims.

Appropriated by act approved March 3, 1901.....	\$960.21
Disbursed during the year.....	<u>860.21</u>

Appliances for Disabled Soldiers, 1901.

Appropriated by act approved June 6, 1900.....	\$ 2,000.00
Disbursed during the year.....	<u>1,454.52</u>

Balance on hand June 30, 1901.....	<u>545.48</u>
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Appliances for Disabled Soldiers, 1900.

Balance July 1, 1900, act of March 3, 1899.....	979.50
Disbursed during the year.....	<u>74.25</u>

Balance on hand June 30, 1901.....	<u>905.25</u>
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Appliances for Disabled Soldiers, 1898.

Balance July 1, 1900, act of July 1, 1898.....	\$690.11
Transferred to surplus fund.....	<u>690.11</u>

Army Medical Museum, 1901.

Appropriated by act approved May 26, 1900	\$5,000.00
Disbursed during the year	2,889.70
Balance on hand June 30, 1901,	<u>2,110.30</u>

Army Medical Museum, 1900.

Balance July 1, 1900, act of March 3, 1898	\$2,113.43
Disbursed during the year	1,453.00
Balance on hand June 30, 1901	<u>660.43</u>

Army Medical Museum, 1899,

Balance July 1, 1900, act of March 15, 1898	\$14.80
Transferred to surplus fund	<u>14.80</u>

Library, Surgeon General's Office, 1901.

Appropriated by act approved May 26, 1900	\$10,000.00
Disbursed during the year	<u>6,675.87</u>

Balance on hand June 30, 1901	<u>3,324.13</u>
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Library Surgeon General's Office, 1900.

Balance July 1, 1900, act of March 3, 1899	1,224.63
Disbursed during the year	<u>1,213.42</u>

Balance on hand June 30, 1901	<u>11.21</u>
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Furnishing Trusses to Disabled Soldiers, (sections 1176, 1177 and 1178. Revised Statutes, and act of March 3, 1879.)

Expended during the year	\$7,807.44
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Artificial Limbs and their Commutation. Under the laws relating to artificial limbs there were furnished during the year ended June 30, 1901, 37 artificial legs, 2 arms and 2 feet, while commutation certificates were issued and paid in the cases of 151 amputated legs, 113 amputated arms, 9 amputated feet and 2,748 cases in which the loss of the use of a limb was regarded as proved by the evidence on file. These cases involved the expenditure of \$156,863.72 from the appropriations available. For the current year the sum of \$125,000 was appropriated which will probably suffice to meet the requirements of the survivors who were last paid in 1899.

During the year ending June 30, 1903, the cases which were paid in the fiscal year ended June 30, 1900 will again re-

quire to be met together with a series of new claimants resulting from disabilities incurred in the Spanish-American war and the Philippine insurrection. In the year ended June 30, 1900, the sum of \$506,595.24 was expended. It is believed that the number of deaths that have occurred among these beneficiaries will be more than offset by claimants for disability from the war forces of the country in service since 1898, together with the increasing disabilities of the survivors of the Civil war. A careful consideration of the conditions indicates that the estimate for the year ending June 30, 1903, should be at least \$514,000.

Appliances for disabled soldiers. During the past year the sum of \$1,528.77 was expended for 192 appliances issued to disabled soldiers.

Trusses. The number of trusses issued and fitted during the year was 1,054 at a cost of \$7,807.44.

Providence Hospital. The Act of Congress approved June 6, 1900, appropriated \$19,000, for the support and medical treatment of destitute patients in the City of Washington, D. C., under a contract to be made with the hospital by the Surgeon General of the Army. During the year 1,711 patients were afforded relief under this appropriation. The average number treated daily was 128 and the average number of days of treatment for each patient was 41.

Army and Navy General Hospital, Hot Springs, Arkansas. Twenty-seven officers were treated during the year, 21 of whom were returned to duty or to residence much benefitted by their treatment in the hospital. In the enlisted men's division 369 were under treatment during the year; 208 of these men were returned to duty, or if ex-volunteers, returned to their homes very much improved.

The Army General Hospital for the treatment of pulmonary tuberculosis at Fort Bayard, New Mexico. In October, 1899, Fort Bayard, New Mexico, was, on my recommendation, discontinued as a military post and its buildings were transferred to the Medical Department of the Army for conversion into a sanitorium or hospital for the treatment of cases of pulmonary

consumption. As the abandonment of the post had been in contemplation for some years the buildings were in poor condition and required many repairs and improvements to fit them for hospital use. These were speedily effected and the hospital is now in excellent condition. The selection of Fort Bayard as a site for a sanitorium has been amply justified by the results. Its location in the dry mountainous region of Southern New Mexico, at an altitude of 6,040 feet, affords a climate permitting comfortable outdoor life during the entire year. During the past fiscal year 344 patients were under treatment in this hospital. Of these 184 were discharged, 40 died and 120 remained under treatment June 30, 1901. Ten of the 40 deaths occurred in patients who had been in hospital less than a month. Of those discharged, 17 had been in hospital but a short time. The others were treated an average of 5.4 months and when they left the hospital 10 were clinically cured, 26 convalescent, 73 improved and 58 not improved.

Army Medical Museum. The total number of specimens in the Museum on June 30, 1901, was 34,988; 813 specimens were discarded or transferred and 381 added during the year.

Library of the Surgeon General's Office. On June 30, 1901, there were in the library 140,539 volumes, 4,644 having been added during the year. There were also 236,728 medical pamphlets and theses, 8,211 having been added during the year. Volume VI, second series of the Index Catalogue, includes the letters G and H to Hernette and forms a volume of 1,051 pages. It will be ready for distribution at the usual time. The appropriation for Volume VII, second series, having been made, the manuscript is in course of preparation for the printer.

Medical Officers, United States Army. The total number of regular medical officers allowed by law under the Army Reorganization Act (approved February 2, 1901) is 321; number in service June 30, 1901, 245; number of vacancies on that date 76. Fifty-seven appointments as first lieutenants and assistant surgeons were made during the year. *Promotions:* Five officers from lieutenant-colonel and deputy surgeon gen-

eral to colonel and assistant surgeon generals; 8 from major and surgeon to lieutenant-colonel and deputy surgeon general; 20 from captain and assistant surgeon to major and surgeon and 5 from first lieutenant and assistant surgeon to captain and assistant surgeon. *Retirements:* Three colonels and assistant surgeons general and 2 captains and assistant surgeons (retired with the rank of major.) *Deaths:* One colonel and assistant surgeon general, 2 majors and surgeons and 1 first lieutenant and assistant surgeon. *Resignation:* One first lieutenant and assistant surgeon.

The appointments were made on the recommendation of examining boards in session in San Juan, P. R., Manila, P. I., Washington, D. C., and San Francisco, Cal. It is gratifying to note that although the percentage of candidates approved by the boards recently in session is 24.84 as compared with 19.23 approved by the boards in session during the ten years 1889—1898 inclusive, there has been no lowering of the standard of admission. So many of the recent candidates were young men who had proved their capabilities physical and professional, by one or more years of active service as volunteer or contract surgeons that the ratio of successful candidates was necessarily higher among them than among the young medical graduates who came before the earlier boards. For instance, few of those who appeared before the board in session in Washington, D. C. had previous service and among them the ratio of approved candidates was only 16.67 per cent as compared with 19.23 per cent during the decade cited.

Medical Officers of Volunteers. All the medical officers of the Volunteers, staff and regimental, appointed under previous acts of Congress were mustered out of service June 30, 1901. Under the act approved February 2, 1901, there were appointed for service in the Division of the Philippines 50 surgeons with the rank of major and 150 assistant surgeons with the rank of captain. One major and surgeon and 2 first lieutenants and assistant surgeons died during the year.

Contract Surgeons, U. S. Army. There were in service June 30, 1900, 462 contract surgeons. During the year ended

June 30, 1901, contracts were made with 265 physicians; 333 contracts were annulled and 7 terminated by death, leaving in service June 30, 1901, 387 under contract. Of this number 106 were on duty in the United States, 17 on transports, 14 in Cuba and 250 in the Philippines.

Dental Surgeons. The corps of 30 contract dental surgeons authorized by the act approved February 2, 1901, is in progress of formation. On June 30, 1901, 14 dental surgeons who had passed the examining board were assigned, 1 to the Department of Cuba, 11 to the Division of the Philippines and 2 to posts in the United States.

Army Medical School. Existing conditions in the Army Medical Department rendered it impracticable to carry out the usual school program during the session of 1900-01.

Hospital Corps. On June 30, 1900, the Hospital Corps consisted of 167 hospital stewards, 381 acting hospital stewards and 3,543 privates, a total of 4,091 enlisted men. During the year ending June 30, 1901, the Corps gained by enlistment, reenlistment, transfer from the line, etc., a total of 1,082 men and lost 837, among the latter being 97 by discharge on surgeon's certificates of disability, 36 by death from disease, 2 killed in action, 3 by drowning and 3 by suicide, leaving in service June 30, 1901, 246 hospital stewards, 388 acting hospital stewards and 3,702 privates, a total of 4,336.

To replace the loss of hospital stewards that would be occasioned by the muster out of the volunteer regiments, Congress in its act approved February 2, 1901, allowed an additional 100 hospital stewards making a total of 300. Fifty of the new appointments were allotted to the Division of the Philippines. On the recommendation of the Chief Surgeon of that Division, 27 candidates who had passed the required examination were appointed up to June 31, 1901. To fill the remaining vacancies examinations were held in the United States, Cuba and Porto Rico and 30 successful candidates were appointed.

Owing to an increased demand for men of the Hospital Corps for duty in the Division of the Philippines and with the

China Relief Expedition, general recruiting officers and attending surgeons at important points were granted authority in July, 1900, to enlist desirable men for the Corps without reference to this office. The number required having been obtained this general authority was withdrawn in September, 1900, and thereafter enlistments were authorized only in cases where the candidates had previous service in the Army or were exceptionally desirable by reason of education, character and physique. In January, 1901, to meet the current requirements of the Corps recruiting was resumed. By the end of March sufficient men had been enlisted for this purpose when general recruiting was again suspended and remains so up to this time.

During the year special attention has been given to the instruction of the men of the Hospital Corps, it being realized that a considerable part of the success of the department depends upon this important organization. Of the nearly 5,000 men now constituting the Corps a very large part have entered the service since 1897 and but few of them, from the necessities of the situation, could receive the careful training given the sanitary soldier in our Army before the Spanish-American war.

Schools of instruction have been maintained at the Army General Hospital Washington Barracks, D. C., at Fort McDowell, Cal. (Angel Island) and at Hospital No. 3, Manila, P. I. Most valuable work has been done in these organizations which are now all running on a high plane of efficiency. Detachments of instruction were established at such posts as Fort Columbus, N. Y., Fort Sheridan, Ill., Fort Snelling, Minn., Fort Leavenworth, Kans., Fort Sam Houston, Texas, Fort Logan, Colo., and Vancouver Barracks, Wash.

I take pride in stating that the men of the Hospital Corps have borne themselves creditably under all conditions of service. Many have been specially commended during the past year.

Army Nurse Corps. With the passage of the Army Reorganization bill the Nurse Corps became part of the Medical

Department. During the past year the number of nurses was reduced from 210 to 175, 96 of these are in the Philippines and 43 are on duty in the General Hospital Presidio of San Francisco, Cal., the others scattered.

Medical and Hospital Supplies. The operations of the Supply Department fully described in my annual report for the year ending June 30, 1900, have been continued on the same lines during the past year. Medical and hospital supplies in abundance and of good quality including all modern apparatus and appliances necessary to the proper diagnosis and treatment of diseases and injuries have been promptly furnished for the use of hospitals, military posts and troops in the field. The three principal home depots at New York, St. Louis and San Francisco are conveniently located for the purchase, storage and distribution of supplies and continue to serve their purpose with economy and efficiency to the Department.

With the improved and rapidly improving conditions in our foreign possessions and the concentration and reduction of the military forces stationed there, the work of the Supply Department has been simplified and diminished. The necessity for rush orders and emergency action, unavoidable during hostile operations, is less frequent and more opportunity for deliberation and the exercise of economy is presented.

Since my last annual report a corps of contract dental surgeons has been attached to the Medical Department, which made it necessary to provide professional outfits of instruments and appliances required in their field and laboratory work and to arrange these supplies for packing in secure and convenient form for transportation and use under the conditions presented in the military service. This has been successfully accomplished and these equipments are now in the hands of dental surgeons at various stations from Porto Rico to the Philippines.

Medical Inspections. I would again respectfully renew my recommendation that the regulation which has for several years practically interdicted systematic inspections by chief

surgeons and which regulation is continued in force in par. 1671 A. R., 1901, be modified to read "Chief surgeons will visit each post in their departments at least once a year," etc. No argument in support of this would seem to be necessary. The work of the Medical Department is primarily with men and secondarily with material. The men are the invalids, who represent a considerable percentage of the line of the Army, whose condition and wants can be intelligently appreciated only by an educated physician, and the personnel, the sanitary soldiers, who care for them. In other services the necessity for such inspections is admitted and met by a corps of medical inspectors. Indeed this was the case in our service during the war of 1861—65. But since the promulgation of this regulation, which includes the period during and since the Spanish-American war, such medical inspections have been made irrespective instead of because of regulations.

Recruiting. The total number of men examined for enlistment in the Regular Army during the year 1900, was 39,916. The ratio of accepted men was considerably smaller than during the years immediately preceding. In 1897, a year of peace, the ratio was 702.19 out of every thousand examined. In 1898 during the active recruiting to increase the numerical strength of the army the accepted men numbered 770.47 per thousand examined but in 1899 the ratio decreased to 681.24 and during the past year to 563.16 showing evidently that greater care is exercised in the selection of men for the service.

Identification of deserters and other undesirable men. By the use of the outline figure card 351 men were identified in 1900 and 265 during the first half of 1901.

HEALTH OF THE ARMY. The health of the Army must be regarded as having been unusually good during the calendar year 1900; but to give a proper valuation to this statement the statistics of our Army from the time of the Civil war must be taken into consideration. For many years after that war the admissions to sick report, discharges for disability and deaths were somewhat similar to those reported during the past year but then they were the result of service in the gar-

ritions of the United States while now they result from what practically has been war service in the Philippine Islands. Sanitary improvements in the condition of the soldier gradually lessened the rates year after year subsequent to the Civil war among the troops in the United States, until in 1894 the admission rate from all causes fell to 1089.73 per thousand of strength. The lowest admission rate for disease was 830.65 in the year 1896. The lowest death rate from all causes was 5.11 per thousand of strength, 3.14 having been the rate for disease, both of which were recorded in the year 1897, the year preceding the great change in the sanitary environment of the soldier which resulted from the outbreak of the Spanish-American war. Following that outbreak we had heavy rates of sickness and mortality due to the exposures of active service in Cuba, Porto Rico and the Philippine Islands. For a short time these rates were in excess of those of the Civil war when at their worst, but the sanitary knowledge of the present time put to energetic practical use speedily caused a cessation of these excessive war rates, leaving the ratios still as high as those which prevailed in the garrisons of the United States for a number of years after the close of the Civil war.

The increase in the ratios of admissions to sick report, discharges and deaths during the past year over those of the years 1894-1897, is due to the relatively large proportion of our military force which served under war conditions in the Philippine Islands and China; but for this, the rates given by the Army would have made a very satisfactory record as those given by troops serving in Cuba, Porto Rico and the United States were by no means heavy.

The admission rate for all causes in the Army; volunteers and regulars with a mean strength of 100,389 in 1900 was 2311.81 per thousand of strength as compared with 2178.06 in the previous year; but during the year 1899 only 39,280 men out of a total of 105,546 were serving in the Philippines while during the past year 66,882 of a total of 100,389 were thus serving. This is an important point to remember in considering the sick rates of the two years.

The troops serving in the United States during the year 1900 (mean strength 20,690) had an admission rate of 1510.97 per thousand of strength as compared with 1677.51 during the previous year. The death rate was 7.78 from all causes per thousand of strength as compared with 7.89 in the previous year; 4.83 from disease as compared with 6.56 and 2.95 from injury as compared with 1.33.

In the Philippine Islands with a mean strength of 66,882, the admission rate was 2621.96 as compared with 2395.52 in the previous year, this increase being mainly due to disease among the volunteers, the ratio for which rose from 1859.21 to 2761.79. The regulars on the other hand showed a marked decrease in the ratio of admission for disease which fell from 2454.10 to 2197.73. Two-thirds of the admissions for disease were caused by malarial fevers and diarrheal diseases. The deaths from all causes amounted to 28.75 per thousand of strength as compared with 30.58 in the previous year. Disease occasioned 20.26 deaths, the principal cause of the fatalities being dysentery, which with other intestinal diseases gave a rate of 9.08. The rate from injury amounted to 8.49.

The death rate in China was large, 47.76 per thousand of strength, 23.62 from disease and 24.14 from injury.

From the close of the calendar year 1900 to the latest reports, the health of the troops in the Philippines has been steadily improving. The Chief Surgeon has reported a progressive diminution in the non efficiency of the command from disease and injury. In July and August, 1900, the non efficiency constituted 9.47 and 9.58 per cent of the strength. From January to June, 1901, the non efficiency was less than 7 per cent, the lowest rate 6.12 per cent, having been recorded in March. Intestinal and gastric diseases including dysentery and typhoid fever gave 34.22 per cent of the total sickness, malarial fevers 15.23 per cent and venereal diseases 13.10 per cent. Typhoid fever which scourged our camps in 1898, appeared only sporadically constituting merely 1.78 per cent of the total sickness. Most of the malarial cases were mild and made little or no figure in the mortality returns. Smallpox, so

prevalent and deadly in the early occupation of the islands has almost entirely been suppressed. Dysentery, constituting 13.44 per cent. of all cases of sickness, is the dangerous disease. Bubonic plague, although a subject of importance to the medical officers, members of the Board of Health of Manila and to those temporarily assigned for duty with the board as inspectors, on account of its prevalence among Chinese and Filipinos, appears to have given but little anxiety to medical officers serving with troops, as during the year only one case was reported as having occurred in the Army in the person of an enlisted Chinese cook of the 27th infantry at Camp Stotsenberg, near Manila.

The health of the troops serving in Cuba was excellent during the year. With a mean strength of 8,690 the admission rate was 1873.07 as compared with 2749.74 in 1899, the rate for disease having been 1586.19 as compared with 2537.98. The death rate from all causes was 9.78 as against 18.30 in 1899. But for the occurrence of yellow fever the death rate from disease in this command would have been only 4.72 per thousand of strength. One hundred and forty-four cases were reported of which 32 were fatal, giving a death rate of 3.68 per thousand of strength. Since the close of the calendar year the health of the troops has continued good. Under date of July 26, 1901, the Chief surgeon reported that since November, 1900, the only cases of yellow fever that had occurred in our military garrisons were the nine cases in the persons of men who were experimentally inoculated by infected mosquitoes at Quemados.

As a result of the American occupation of the Island, every city has its health officer and every inland town where troops are stationed has had its sanitary condition more or less improved by the energy of the post commander and medical officer, the latter acting as a sanitary inspector for the municipality.

The medical record of the troops in Porto Rico for the year 1900, is an excellent one, comparing favorably with that of the troops serving at the home stations. With a mean

strength of 2,180 for the year the admission rate for all causes of disability was 1577.98 as compared with 2522.40 during the previous year. The death rate was only 5.05 per thousand of strength as against 11.27 in 1899. All the deaths were the result of disease. It will be observed that this death rate is lower than the lowest recorded death rate in our Army, 5.11 per thousand in 1897, in the carefully supervised garrisons of the United States prior to the sanitary change made by the outbreak of the Spanish-American war.

PREVALENCE OF SPECIAL DISEASES. Cases of *scarlet fever*, *diphtheria* and *cerebro-spinal fever* were, as usual, rare among the troops. *Measles* and *mumps* were, on the other hand, of quite frequent occurrence. In the United States measles had an admission rate of 11.36, the mean annual rate for the previous decade having been 8.46 per thousand of strength. The infection of this disease was imported into the Philippine Islands on almost every transport. The admission rate for Volunteers in these islands was 8.18 per thousand of strength and for regulars 1.61. Similar rates prevailed as regards mumps.

Typhoid Fever. No epidemic of typhoid fever occurred among the troops during the year. In the army as a whole the admission rate was 9.74 per thousand of strength and the death rate 1.63, as compared with the mean annual rates, 5.19 and .56, for the ten years preceding the outbreak of the Spanish-American war. Among troops in the United States the admission rate was 5.56, the death rate .43 per thousand of strength. In addition to these there was quite a large admission rate for fevers of undetermined causation most of them probably typhoid fever of mild character as these cases had practically no death rate.

Yellow fever. During the calendar year 1900 there were 144 cases of this disease, 32 of which were fatal, reported from the Army, showing for the whole Army, regulars and volunteers with a strength of 100,389 men, an admission rate of 1.43 and a death rate of .32 per thousand of strength. During the decade 1889-98 the mean annual admission rate was 2.08 and the death rate .25 per thousand men.

Malarial fevers. The rates for malarial disease were heavy during the year, owing to the great prevalence of these diseases in the Philippines and Cuba. The admission rate for the whole army was 706.52 and the death rate 1.36 as compared with the mean annual rates of the decade 1889-98, 174.29 and .58. The rates for the Volunteers in the Philippines were: Admission 1108.75 and death 1.98; for the regulars; 742.82 and 1.64 respectively per thousand of strength. Cuba followed with an admission rate of 581.35 and a death rate of 1.04. In Porto Rico and China the prevalence and mortality were relatively light. In the United States the admission rate was 166.20 and the death rate .05 per thousand of strength.

During the current year so much has been done in the practical application of methods for the prevention of malarial diseases, based on the diffusion of our knowledge of the means by which these diseases are propagated by infected mosquitoes, that a safe prognostication may be given of a lessened non-efficiency from these diseases in the next report of the Surgeon General of the Army.

Consumption. For tuberculosis of the lungs the admission rate for the year, 4.92 per thousand of strength, was much higher than the mean annual rate of the previous decade, 2.66. The rate of discharge for disability was 1.36 as compared with 1.40 for the previous ten years and the death rate .96 as compared with .48 as the mean annual rate for the decade. The admission rate was higher, 5.27, in the United States than in any of the other commands except that serving in China where a rate of 7.70 was recorded. The lowest rate, 3.80 was recorded in Cuba but this does not mean that the prevalence of consumption in the West India Islands is notably less than in the United States for the command in Porto Rico gave an admission rate of 4.59 per thousand of strength. It is believed that the sanatorium for consumptives recently established at Fort Bayard, New Mexico, will be of great value in the recovery of incipient cases of this disease.

Venereal diseases. The admission rate for these diseases for the whole army during the year 1900 was 133.97 and the discharge rate 2.36 per thousand of strength as compared with

133.00 and 2.61 during 1899 and with 71.45 and 1.22, the mean annual rates of the decade 1889-98. These large rates prevailed in all the commands except among the Volunteer troops serving in the Philippines, the admission rate for these having been 79.94 and the rate of discharge .41 per thousand of strength. Among the regular troops in the Philippines the rates were respectively 138.88 and .96; among troops serving in the United States 155.39 and 7.29. In China the admissions rose to 173.60 but there was no discharge for disability. In Cuba the admission rate reached 190.68 with 4.03 discharges per thousand of strength and in Porto Rico the excessive admission rate of 367.88 was recorded.

Since the close of the calendar year reports from the Chief Surgeon of the Division of the Philippines show these diseases to have increased materially in their prevalence. In April, 1901, they constituted 20.42 per cent of the total sickness as compared with 8.97 per cent in September, 1900. The Board of Health of Manila has instituted measures for the control of these infections among the women of the town including the segregation of prostitutes in a certain part of the city and a careful system of superintendence over them. Orders have been issued directing an inspection of the troops at regular intervals with the intention of detecting all diseased soldiers and sending them to hospital for treatment. The carrying out of these orders for the examination of all enlisted men has added to the sick list many cases that would have otherwise been treated privately and not appeared on the sick reports. Los Banos on Laguna de Bay which has hot springs closely resembling in composition those of the Hot Springs of Arkansas, has been selected as a suitable place for the treatment of syphilitics and some of these cases are now there undergoing treatment.

Similar efforts have been made in Cuba and Porto Rico to control these diseases.

Alcoholism. The admission rate for alcoholism in the Army as a whole during the year 1900 was 15.34 per thousand of strength as compared with 14.49 in 1899 and with 28.67, the mean annual rate of the decade 1889-98. Troops serving in

the United States during the past year had 22.43 admissions per thousand of strength. The steady decrease of late years in the admissions for alcoholism among the men of the Regular army is a matter for congratulation. Military officers may be said to be unanimous in their opinion that this was mainly the result of the establishment of the post exchange or canteen at military posts. The following shows this gradual improvement: Mean annual admission rate of the decade ending with 1889, 56.68 per thousand of strength. Admission rate for 1889, 41.41; for 1890, 40.73; for 1891, 40.01; for 1892, 37.23; for 1893, 33.97; for 1894, 30.94; for 1895, 30.11; for 1896, 29.06 and for 1897, 27.86. In 1898 the altered conditions consequent on the Spanish-American war prevented further comparisons. There is less drunkenness among troops in active service than in a command doing garrison duty in the times of peace. In the Philippines during the past year the admission rate for alcoholism among the Volunteers was 8.68 and for Regulars 12.41; for troops in China 7.70. These statistics do not sustain the newspaper reports of drunkenness among the troops in the Philippines. In fact medical officers report the habits of the enlisted men in the Philippines as very much the same as in the United States. Much of the evil effects of intemperance in the Philippines is attributed to the use of the native intoxicant vino which is a crudely distilled alcohol causing rapid intoxication which is readily recovered from when a moderate quantity is taken but which taken in excess causes wild delirium and unconsciousness and in habitual users induces a deterioration of the mental faculties.

Insanity. Of insanity 273 cases were reported, equivalent to an annual rate of 2.72 per thousand of strength. Of these cases 149, or somewhat more than one-half, were discharged from the service and sent to the Government Hospital for the Insane at Washington, D. C., for treatment. The remaining 124 cases were returned to duty at various periods after having been taken on the sick report. The admission rate in 1899 was 1.78 and the proportion of those sent to the Government Hospital formed .87 per thousand of the strength. The increase during the past year is explained by the nervous depression and home sickness among the relatively larger pro-

portion of the strength of the Army serving in the Philippines.

Diarrheal diseases. During the year 1897 when all the troops of the United States served at the home stations, the admission rate for diarrheal diseases was 73.77 per thousand of strength, with no death. Dysentery was a comparatively rare disease and seldom fatal. In 1898 as a result of war service in Cuba, Porto Rico and the Philippines the admission rate rose to 388.62 and the increased gravity of the cases was manifested by a death rate of 1.45 per thousand of the strength. During the following year, 1899, the admission rate was 380.69 with a death rate of 2.14. During the past year the admission rate increased to 465.01 and the death rate to 6.47 on account of the relatively large proportion of the Army which was exposed to the causes of diarrheal and dysenteric diseases in the Division of the Philippines. Among troops serving in the United States the admission rate was only 96.57; in Porto Rico 148.17 and in Cuba 166.75 and the death rates in these commands was relatively small. But in the Philippines among the regulars the admission rate was 488.25 and among the Volunteers 736.05, while among the troops engaged in the dangerous campaign in China it rose to 1266.54 per thousand of the strength. The heavy mortality rates occurred in these commands. Among the Pacific Islands the death rate was 7.47 per thousand of strength; among the Volunteers 10.88 and among the troops of the China Relief Expedition 15.92.

Diseases of the respiratory organs. Diseases of the respiratory organs among troops serving in the United States gave an admission rate of 76.48 and a death rate of .56 per thousand of strength.

Bronchitis gave a rate of 84.39 in the United States. The exposures of the troops during the active campaign in China caused a rate of 92.45 but in the islands this affection was infrequent, the rate in Cuba having been only 29.34, in Porto Rico 29.82 and in the Pacific Islands among the Regulars 34.59 and among the Volunteers 44.60.

Pneumonia also had its highest prevalence in the United States, 4.25 per thousand of strength, followed in China by a rate of 3.08 while in Cuba the rate was only 1.61, in Porto

Rico 2.29 and in the Pacific Islands 2.12 among the Regulars and 2.61 among the Volunteers. The death rate, however, from this disease was highest among the Volunteer troops in the Philippines, .76 per thousand men, as compared with .25 among the Regular troops serving with them and with .34 among the troops serving in the United States.

INJURIES. The admission rate for injuries in the Army, regulars and volunteers, in 1900 was 196.27 and the death rate 6.95 per thousand of strength, contusions and sprains contributing largely to the former and gunshot wounds to the latter.

Gunshot wounds. During the calendar year 1900, 377 men were killed by gunshot, 305 in action and 21 by accident; 30 of the deaths were suicidal and 21 homicidal. Besides the 377 killed by gunshot 1,173 cases were received in the hospitals for treatment; 782 were incurred in action, 315 not in action but in the line of duty, 57 not in line of duty, while 12 were suicidal and 7 homicidal.

Ninety-two of the 1,173 cases proved fatal; 70 of which were battle wounds; 12 received in line of duty; 3 not in line of duty; 4 were suicidal and 3 homicidal.

Of the total number struck by gunshot missiles 469, or 30.3 per cent. died from the injuries inflicted. The killed constituted 24.3 per cent of those struck and the wounded 75.7. One man was killed for every 3.1 men wounded. This is a much heavier death record than was given by the gunshot wounds of 1898 and 1899. During those years the killed constituted 11.9 per cent of those struck, the wounded 88.1 per cent. or one man killed for every 7.4 wounded.

Of the 92 cases which terminated fatally 28 deaths occurred among 35 penetrating wounds of the abdomen, a mortality of 80 per cent as compared with 70 per cent in the years 1898 and 1899. Laparotomy was performed in 4 of the 28 cases and an abrasion of the ileum was sutured in one of the 7 cases which recovered.

Sixteen of the 92 deaths occurred among 63 penetrating wounds of the thorax, a mortality of 25.4 per cent as compared with 27.8 during 1898 and 1899.

Fractures of the femur had a mortality of 19 per cent. caused by 7 deaths among 37 patients as against 11 per cent

in 1898 and 1899. During the past year, however, the total number of cases was smaller and the relative number of upper third fractures larger than in the years cited. Fractures of the knee joint had a mortality of 15 per cent.

The mortality in fractures of the spine constituted 69.2 per cent of the cases, 13, of which 9 were fatal; and fractures of the skull were 45.5 per cent fatal, 10 deaths in 22 cases.

Bolo wounds. Besides the gunshot wounds received in action the battle casualties of the year included 41 men killed and 83 men wounded mostly by bolo, kris or spear. Five of the 83 wounded died of their wounds.

Board for the Study of the Etiology and Prevention of Yellow Fever. In my last annual report I referred to the appointment of a board for the purpose of pursuing scientific investigations with reference to the acute infectious diseases prevailing on the Island of Cuba. This board, consisting of Major Walter Reed, surgeon, U. S. Army, and Contract Surgeons James Carroll, Aristides Agramonte and Jesse W. Lazear, U. S. Army, arrived at their station, Columbia Barracks, Quemados, Cuba, on June 25, 1900. Fortunately for the purposes of the board, an epidemic of yellow fever, which had begun in the adjacent town of Quemados, Cuba, during the latter part of the month of May, was still prevailing so that an opportunity was afforded for bacteriological and pathological observations in this disease. The results obtained were especially valuable showing that the bacillus icteroides (Sanarelli) bears no causative relation to yellow fever and that the mosquito serves as an intermediate host for the parasite of this disease. Further experiments of a most interesting character demonstrated that yellow fever is transmitted to non-immunes by the bite of a mosquito that has previously fed on the blood of those sick with this disease; that yellow fever can also be produced by the subcutaneous injection of blood taken from the general circulation during the first and second days of the disease; that an attack of yellow fever produced by the bite of the mosquito confers immunity against the subsequent injection of infected blood; that yellow fever is not conveyed by clothing, bedding or merchandise soiled by contact with those sick with the disease; that a house may be said to be

infected with yellow fever only when there are present in it mosquitoes capable of conveying the parasite of the disease and that the spread of yellow fever can be most effectually controlled by measures directed to the destruction of mosquitoes and the protection of the sick against the bites of these insects.

The importance and far-reaching consequences of the observations made by Major Reed and his associates at Quemados, Cuba, can hardly be overestimated. For the first time in the history of this widely prevalent tropical disease we are in possession of knowledge with regard to the manner of its propagation which will enable us, I believe not only to check its ravages but to effectually stamp it out whenever it may appear in any of our garrisons or cities.

With the view of promptly arresting the spread of the disease full instructions were issued in a circular from Headquarters Department of Cuba for the information and guidance of medical and commanding officers. Already the authorities in the City of Havana, based on the work of Major Reed and his associates have resulted in practically ridding that city of yellow fever for the first time in more than one hundred and forty years.

Board for the investigation of tropical diseases in the Philippines. Much excellent work has been done by this board in the study of animal parasites, dysentery, fevers, bubonic plague and other tropical diseases, while some valuable reports have been received from medical officers not members of the board. Under authority from this office excerpts from the reports on these subjects were published in the form of circulars by the Chief Surgeon, Division of the Philippines, with the view of presenting to the medical officers of the Division the results of the investigations that had been made.

Circular No. I, by Lieutenant R. P. Strong, assistant surgeon, U. S. Army, published in February, 1901, discusses the subject of animal parasites. Circular No. II, also by Lieutenant Strong, published in April, 1901, gives full information concerning dysentery and its causes. Circular No. III by Lieutenant W. J. Calvert, assistant surgeon, U. S. Army, published in May, 1901, consists of an epitome of our knowl-

edge on the subject of bubonic plague. The value of these circulars has been so highly appreciated by medical men that calls for copies of them are constantly being received.

Exhibit of the Medical Department at the Pan-American Exposition, Buffalo, New York. The exhibit, which was in charge of Captain E. L. Munson, assistant surgeon, U. S. Army, consisted of a brigade field hospital of 100 beds, and was excellently located on a plot of ground immediately south of the Government Building, very accessible to visitors and of sufficient size not only to contain the hospital tentage without crowding but also furnish an adjoining space suitable for drill purposes. The hospital was fully equipped in all its details according to the provisions of the latest supply table; the purpose being to leave nothing to the imagination of visitors, the majority of whom would be unfamiliar with military matters, but to demonstrate the equipment of the Medical Department, in respect to the brigade hospital unit, in quantity, size and capacity as well as in form, variety and quality.

The number of visitors who have inspected the field hospital and witnessed the exhibition drills of the hospital corps is very great* and my expectation that this exhibit would prove an attractive and interesting as well as instructive feature of the Exposition has been amply justified. The character of the exhibit is such as would naturally attract military and medical men, and in addition, the recent war with Spain and hostilities in the Philippines and in China have aroused a general interest in military matters. A large proportion of visitors at the Exposition have had relatives or friends in the regular or volunteer forces and these, particularly the women visitors, have shown much interest in the methods and appliances by which sick and wounded soldiers are cared for by this Department in the field. As a means of educating the popular mind with respect to the efficiency of the Medical Department, this exhibit has thus been of very great value.

GEORGE M. STERNBERG.

[*In the note on this subject on page 306 of the present number of the JOURNAL, the types erroneously make the editor to say that as many as two thousand persons visited the exhibit in a single day. The fact is that no less than twelve thousand visitors were received on several occasions.—EDITOR J. A. M. S.]



COAT OF ARMS OF THE
MEDICAL DEPARTMENT,
U. S. ARMY.



Genl. George Washington Sternberg, Lvy., Gen. U.S.A.

Original Memoirs.

RESUMÈ OF THE HISTORY OF THE MEDICAL
DEPARTMENT OF THE UNITED STATES
ARMY, FROM 1775 TO THE BEGINNING
OF THE SPANISH-AMERICAN WAR.*

By LIEUT. COL. JOHN RENSSLEAER HOFF.

MEDICAL DEPARTMENT, U. S. ARMY.

FROM the beginning of the settlement of our country there was conflict not only between man and nature, but between man and man. Every settler from the force of circumstances became a soldier, and while organization for military purposes was necessarily of the simplest character, there was such organization, and doubtless the medical man was a factor in it. As the population grew, the little wars took upon themselves more definite form, the more venturesome of the people organized themselves into bands or companies, and from time to time regular troops were sent from the mother country, with the organization then recognized as most satisfactory.

With the outbreak of the War of the Revolution all that our people knew of military affairs came from the British, and it was not unnatural that such organization as was contemplated for the American army was modeled on that of their foes.

The history of the medical department of our army begins with the siege of Boston, in 1775. As Major Brown re-

*SOURCES OF INFORMATION:

History of the Medical Department, U.S.A., Brown.

Legislative History of the General Staff of the Army of the U.S.

The Army of the U.S., 1789-1896. The Medical Department, Smart.

The Medical and Surgical History of the War 1861-'65, etc., etc.

marks in his interesting sketch: "The force which gathered at Cambridge after the battle of Lexington was a spontaneous assemblage of the people and resulted from the burst of patriotism and alarm which swept throughout the country, calling the farmer from the plow, the mechanic from his shop, the clergyman from the pulpit, and the physician from the bedside of the sick." The men who thus collected at Cambridge were a heterogeneous mass without definite formation. There was no staff, but the practical necessities of the situation developed one, each member of this unformed mass being assigned to the special work for which he was best fitted.

The second provincial congress of Massachusetts Bay was at this time in session, earnestly occupied with the organization of troops, and it is not surprising that from the beginning they saw the immediate necessity for an organization for the care of the sick and wounded. It is interesting to observe that even at this time and under these conditions, its first enactment in this direction was to provide for the examination of all persons seeking appointment in the medical department. The first resolution relating to this matter was passed on the 8th day of May, 1775, as follows:

Resolved. That the persons recommended by the commanding officers of the several regiments be appointed as surgeons to their respective regiments, *Provided* they appear to be duly qualified on examination.

We find a note of interest in this connection in Thacher's Military Journal of the Revolutionary War, which reads as follows:

On the day appointed, the medical candidates, 16 in number, were summoned before the board for examination. This business occupied about four hours; the subjects were anatomy, physiology, surgery, and medicine. It was not long after, that I was happily relieved from suspense, by receiving the sanction and acceptance of the board, with some acceptable instructions, relative to the faithful discharge of duty, and the humane treatment of those soldiers, who may have the misfortune to require my assistance. Six of our number were privately rejected as found disqualified. The examina-

tion was in a considerable degree close and severe, which occasioned not a little agitation in our ranks.

The organization of medical relief did not stop with the appointment of regimental medical officers, or the establishment of the regimental hospital. We find that after the battle of Breed's Hill a hospital was established in Cambridge under the celebrated Dr. John Warren. Hospitals were also established in neighboring towns, and even as early as the 27th of June, 1775, a contagious disease hospital was found necessary, showing how rapidly disease manifested itself in aggregations of raw levies.

The regulations for the medical department at this time were of an exceedingly simple character. On the first of July the Provincial Congress passed the following preamble and resolution:

In order that all the sick and wounded of the Army may be provided for, and taken care of, in the best way and manner possible:

Resolved, and it is hereby ordered:

That, when any person in the army is so ill, either by a wound or otherwise, that the surgeon of the regiment to which the sick or wounded person belongs, finds the sick or wounded as above said, cannot be properly taken care of in the regiment to which he belongs, said surgeon shall send the sick or wounded as above said, to the hospital provided for the use of the camps to which they belong; and a certificate of the man's name, and the company or regiment to which he belongs; and in that case, the surgeon of the said hospital shall receive the said sick or wounded under his care; and in case said hospital shall become too full, the surgeon of the said hospital shall send such of his patients as may with safety be moved to the hospital at Watertown, and a certificate setting forth the man's name, what company and regiment each belongs to; and in that case, the surgeon of the Watertown hospital shall receive such sick or wounded under his care.

The allowance of medical officers for the hospital was fixed at two surgeons and two surgeon's mates, and for a regiment in the field one surgeon and two mates, the pay of the former being \$40 per month and that of the latter \$22.50.

It cannot be imagined that this organization worked

without friction. It was a new machine driven by unfamiliar hands. Indeed we find it stated that notwithstanding the anxiety of Congress to provide for the sick, their efforts were by no means successful. An historian of this period says:

The vicious privilege, so fatal to all discipline, has been permitted of allowing the soldiers to choose their own officers, and these officers in turn had the nomination of surgeons, and too often personal popularity was sought for rather than professional fitness; a defect which was not entirely obviated by the examination to which all candidates were subjected. Again, surgeons and patients came from the same country village or town, and it took them a long time to appreciate the fact that the social equality which was to be admired in civil life, was incompatible with the discipline of the field.

General Washington had just been appointed commander-in-chief. Other staff departments had been organized, but the medical department had not thus been provided for; it was without a head. The commander-in-chief on July 21, 1775, thus expressed himself in a letter to Congress:

I have made inquiry into the establishment of the hospital, and find it in a very unsettled condition. There is no principal director, nor any subordination among the surgeons; of consequence, disputes and contentions have arisen, and must continue until it is reduced to some system. I could wish it was immediately taken into consideration, as the lives and health of both officers and men so much depend on a due regulation of this department.

But before this letter was written, Congress had appointed a committee to consider the method of establishing "the hospital," a term used to include the whole medical arrangement of the army. The committee reported a bill, which was agreed to as follows:

That, for the establishment of an hospital, for an army consisting of 20,000 men, the following officers, and other attendants, be appointed, with the following allowances of pay, viz:

One director-general and chief physician, his pay per day, four dollars.

Four surgeons, each ditto, $1\frac{1}{2}$ dollars.

One apothecary, ditto, $1\frac{1}{3}$ dollars.

Twenty surgeon's mates, each ditto, $\frac{2}{3}$ of a dollar.

One clerk, ditto, $\frac{2}{3}$ of a dollar.

Two storekeepers, each four dollars per month.

One nurse to every ten sick, 1-15 of a dollar per day, or two dollars per month.

Laborers occasionally.

The duty of the above officers:—

The director to furnish bedding, medicines and all other necessaries; to pay for the same, superintend the whole, and make his report to, and receive orders from the commander-in-chief.

Surgeons, apothecaries, and mates:—To visit the sick, and the mates to obey the orders of the physicians, surgeons, and apothecary.

Matron: To superintend the nurses, bedding, etc.

Nurses: To attend the sick, and obey the matron's orders.

Clerks: To keep accounts for the director, and storekeepers.

Storekeepers: To receive and deliver bedding and other necessaries, by order of the director.

This very sketchy and unsatisfactory scheme would indicate that at this time Congress had very little idea of the magnitude of the struggle before them. However, it was a long step in advance; it was something definite.

Dr. Joseph Warren was proposed for the position of director-general, of the Army at Cambridge, but preferring an active command in the field he accepted a major general's commission, and it will be remembered was killed at Breed's Hill. The actual selection fell upon Dr. Benjamin Church, who, unfortunately for the department, proved recreant to his trust, and did little or nothing to improve the efficiency of his department. Dr. John Morgan, of Philadelphia, a man of large literary and scientific attainments, and who had had considerable experience in military sanitation gained as a medical officer in the struggle between the English and French for the possession of Canada, succeeded to the office of director-general. Dr. Stringer was appointed to the Army of the North and Dr. Rickman to that of Virginia. Dr. Morgan did much to introduce system into his department, but it can be well imagined that the situation was anything but desirable, and

in fact there is ample testimony showing that the sick and wounded of the war of the revolution were subjected to the greatest hardships. In spite of every effort on the part of Dr. Morgan, he was made the object of bitter attack not only within but without the Army. Material of all kinds was lacking; hospitals were destitute of everything needed to render the men comfortable; few of the surgeons had any instruments; medicines were very scarce; and surgical dressings were almost entirely wanting. In this emergency, Dr. Morgan successfully appealed to the charity and patriotism of the inhabitants of the surrounding country who so far as possible supplied the wants of the sick and wounded.

It will be interesting to observe that on the 2d March, 1776, out of an aggregate force of 18,524 men, 2,398 were present sick, and 367 were absent sick, or 15 per cent of sickness, which was nearly 25 per cent greater than at any time during the Spanish-American War.

After the removal of the headquarters of the army from Boston to New York, Director-General Morgan made a successful effort to improve his department, but experienced much trouble with the regimental hospitals. The medical officers complained that their pay was not sufficient to enable them to live like gentlemen, while the regimental surgeons were grieved because they thought they were too much subordinated to the general staff. It is interesting to observe in this connection how the same difference runs through the history of all our wars, and even as late as 1898 the question of the regimental versus the division hospital became a very burning one.

On the 17th July, 1776, the Continental Congress passed a resolution which increased the number of hospital surgeons in proportion to the increase in the army, not exceeding 1 surgeon and 5 mates to every 5,000 men, and increasing their pay $1\frac{1}{2}$ dollars per day and giving them rank above regimental surgeons and mates. It also authorized the employment of storekeepers, stewards, managers, etc., and required the rendition of accounts and weekly returns of sick, and forbade the

regimental surgeons drawing upon the general hospitals for hospital stores.

This law, while vaguely expressing the powers of the director-general, was a decided step in advance. Apparently Congress failed to foresee that other armies and departments besides those in Boston would be necessary, and that there should be one head—the director-general over the medical departments of all armies. Indeed, Washington had some months before endeavored to impress upon Congress this fact, but here again was met the opposition of the regimental surgeons, nor were they without logic in their contention, for the regimental hospital, more properly called dispensary, occupies a very definite and important place in a well-considered scheme of military sanitary organization. To meet this condition, hospital regulations were issued, which were in the text stated to have been agreed upon between the director-general of the American Hospital and the regimental surgeons and mates, at New York, in July, 1776. These regulations provided quarters for the regimental hospital into which the sick of the regiment shall be admitted under authority of the regimental surgeons; that these surgeons should keep a register of all admissions and make a return thereof to the commanding officer; that they shall prescribe diet for the sick, and sign the provision return; that they shall not send any sick from the regimental to the general hospital without a transfer slip, neither shall they send those laboring under infectious or malignant diseases; that cooking utensils shall be obtained from the quartermaster's department; that upon the disbandment of the regiments the medical supplies shall be turned into the general hospital; that every regimental hospital shall have a cook, and one nurse to every ten men, who shall be paid a half dollar per week and rations; that it shall also have a corporal's guard of at least three men to keep persons from going in without orders to disturb the sick or to carry liquor to them. "The other persons whilst relieved from standing sentinel, to serve for the time as waiters, and obey the surgeon and mate, in respect to any assistance,

which may reasonably be required in behalf of the sick". Lastly, that in all cases not provided for by the foregoing, or any further regulations that may be agreed upon, the surgeons and mates shall observe the customs and usages of the British army, and shall at all times obey such orders as they shall in the way of duty receive from the director-general for the treatment of the sick or for the discharge of the duties of their station.

Owing to the want of a well-defined central authority, the bickerings of medical officers become more and more marked as the war progressed. The necessary organization of separate armies and the appointment of medical officers as chief surgeons without control from the centre, resulted in the utmost confusion and consequent failure, with crimination and recrimination from all sides.

On the 15th July, 1776, Dr. William Shippen, of Philadelphia, was appointed chief physician to the flying camp of 10,000 men, established at Trenton, N. J.; and Dr. Jonathan Potts was appointed to the Canadian department, to succeed Dr. Stringer who had been appointed chief surgeon at the instigation of General Schuyler, and who before he was finally disposed of caused no little trouble in the department.

There was no further important legislation by Congress in 1776 regarding the medical department though some fifteen resolutions were passed. Early in 1777 Dr. Morgan through a resolution of Congress, was dismissed from the office of director-general. This result followed the faulty organization, the extreme difficulties of the situation, and the disloyalty and opposition of the officers of his department. Unfortunately for Dr. Morgan the scandals became so great that a scapegoat was necessary, and he was selected. He was called on for his resignation, but refusing to resign was summarily dismissed. He remained under the stigma of dismissal for upwards of a year. At length, in 1778, he prepared an elaborate memorial in his defense which he transmitted to Congress, and which nearly a year afterwards received consideration, as is shown by the following resolution:

Whereas, by report of the Medical Committee, confirmed by Congress on the 9th of August, 1777, it appears that Dr. John Morgan, late director-general and chief physician of the general hospital of the United States, had been removed from office on the 9th of January, 1777, by reason of the general complaint of persons of all ranks in the army, and the critical state of affairs at that time; and that the said Dr. John Morgan requesting an inquiry into his conduct, it was thought proper that a committee of Congress should be appointed for that purpose; and whereas, on the 18th day of September last, such a committee was appointed, before whom the said Dr. John Morgan hath in the most satisfactory manner vindicated his conduct in every respect as director-general and physician in chief, upon the testimony of the commander-in-chief, general officers, officers in the general hospital department, and other officers in the army, showing that the said director-general did conduct himself ably and faithfully in the discharge of the duties of his office, therefore:

Resolved, That Congress are satisfied with the conduct of Dr. John Morgan while acting as director-general and physician in chief in the general hospitals in the United States; and that this resolution be published.

This was a very handsome apology for the wrong done, but it would have been more to the purpose if they had ordered the investigation before they disgraced him by a summary dismissal. Even now they did not restore him the position of which he had been so unjustly deprived, and he retired to private life, broken in spirit by the treatment he had received; a blow from which he never entirely recovered. He died on the 15th of October, 1789, at the age of 54 years.

Dr. Stringer, who was dismissed at the same time with Dr. Morgan, and who was the medical director of the northern army, was apparently more of a politician than a medical officer, and his dismissal was but tardy justice for continual neglect of duty.

The condition of affairs in the northern army at that time may be inferred from a report of the committee of Congress, from which I quote:

Your Committee beg leave further to report that they have visited the General Hospital for the Northern Army, situated at Fort George; that there is a range of buildings

erected convenient for the purpose, which on the 20th day of October last contained about 400 sick, including those wounded and sick sent from Gen. Arnold's fleet; that they were sufficiently equipped with fresh mutton and Indian meal, but wanted vegetables; that the director-general in that department obtained a large supply of medicines, but the sick suffered much for want of good female nurses and comfortable bedding, many of these poor creatures being obliged to lay upon the bare boards. Your Committee endeavored to procure straw as the best temporary expedient, but they earnestly recommend it to the attention of Congress that a quantity of bedding be speedily furnished. * * * *

Your Committee cannot omit mentioning under this head the complaints which they have received from persons of all ranks, in and out of the army, respecting the subject of ill treatment of the sick. It is shocking to the feelings of humanity, as well as ruinous to the public service, that so deadly an evil has been so long without a remedy. Your Committee do not undertake to determine from what quarter the mischief has arisen, but they most earnestly recommend that a strict inquiry be immediately made into the conduct of director-general of hospitals; their surgeons, other officers and servants; and that exemplary punishment be inflicted on all such as shall be found to have neglected their duty.

The necessity for a better organization of the medical department each day became more apparent. Nearly two years of active service had now passed, and the physicians who in the beginning of the revolutionary war had no knowledge of military sanitary organization, through practical experience in active service had learned its requirements, and insisted that they should be met.

On February 14, 1777, General Washington forwarded to Congress a plan for the arrangement and regulation of the General Hospital, submitted by Drs. Shippen and Cochran, with his approval, which plan after debate was adopted on the 7th day of April, 1778. Washington said of it: "The number of officers mentioned in the enclosed plan I presume are necessary for us because they are found to be so in the British hospitals." Notwithstanding the grave faults in this law, due largely to the fact that at that time the practice of physic and surgery were really two separate and distinct professions, and

as a consequence the multiplication of offices was thereby made necessary, the law marked another step in advance. It definitely fixed the status of the director-general, making him the executive head of the department. It required reports and returns, through which alone the authorities were enabled to know the state of the army. It placed the regimental medical officers clearly under the authority of the director-general, and was made very liberal in its scope and provisions with the hope, as expressed by a member of Congress, of drawing into the service of their country gentlemen of the first eminence from different parts of the continent. Dr. William Shippen was unanimously elected director-general, and the other offices were filled by physicians and surgeons of eminence.

But even yet matters did not everywhere run smoothly in the medical department; there were bright spots, however. In the north, the campaign of Burgoyne was followed by a large number of cases of sickness and wounds, which were taken to a general hospital established in Albany, containing 40 wards, with capacity for 500 patients. Thacher has given us the following picture of the condition of the hospital at this time:

The foreigners are under the care and management of their own surgeons. I have been present at some of their capital operations, and remarked that the English perform with skill and dexterity, but the Germans with a few exceptions, do no credit to their profession; some of them are the most uncouth and clumsy operators I ever witnessed, and appear to be destitute of all sympathy and tenderness toward the suffering patients. Not less than 1,000 sick and wounded are now in this city; the Dutch church, and several private houses are occupied as hospitals. We have about 30 surgeons and mates, and all are constantly employed. Some of our soldiers' wounds, which had been neglected while on the way here from the field of battle, being covered with putrefied blood for several days, were found on the first dressing to be filled with maggots. It was not difficult, however, to destroy these vermin by the application of tincture of myrrh. Here is a fine field for professional improvement. Amputating limbs, trepanning fractured skulls, and dressing the most formidable wounds, have familiarized my mind to scenes of woe.

Among the troops in the Jerseys the want of supplies caused great suffering. Three thousand men who were fit for duty were detained in the various hospitals because they had no shoes. Hospital stores were scanty and all available means of supply were exhausted. A severe winter was approaching and the sick were without blankets, many of them even without clothes. Every effort was made by the medical department to make up for this scarcity of material, but failed to check the growing discontent against its management. The sick could not believe that their distress was the necessary result of the impoverishment of the country, and they were unfortunately led by imprudent statements of many of the officers to think they suffered in order to enrich those high in authority. Even so sincere a man as Dr. James Tilton wrote that in the fatal year 1777 when the director-general had the entire direction of the practice in our hospitals as well as the whole disposal of the stores, he was interested in the increase of sickness and the consequent increase of expense, as far at least as he would be profited by a greater amount of money passing through his hands.

The director-general was vigorously attacked on all sides, and especially by officers of his own corps, Dr. Rush being an active opponent. "Whatever may have been thought of Dr. Rush's merits as a patriot, statesman, physician, and man of letters, it may be truthfully said that his military career was not a success."

As a result of further investigation of the medical department in the latter part of 1778, the regulations heretofore referred to were modified, looking in the direction of more strict accountability for public funds and property. In June, 1779, the complaints against the medical department, which centered in the person of its director-general, took definite form in the shape of charges of malpractice and misconduct in office, preferred by Dr. John Morgan, who himself had been dismissed the service, the result of which was a court-martial which honorably acquitted the director-general of every charge brought against him.

Again, on September 13, 1780, the organization and regulations governing the Medical Department were modified by an act of Congress, and Dr. Shippen was continued as director-general, and this law was again modified on the 3d of January, 1781.

The last act relating to the medical department during the Revolutionary War was passed on the 1st of January, 1783, and prescribed the pay of the different officers. During this year the reduction of the army took place rapidly and culminated the 2d of June, 1784, in the following resolution:

That the Commanding-Officer be, and he is hereby directed to discharge the troops now in the service of the United States except 25 privates to guard the stores at Fort Pitt; and 55 to guard the stores at West Point, and other magazines; with a proportionate number of officers; no officer to remain in service above the rank of captain, and those privates to be retained who were enlisted on the best terms: *Provided*, Congress before its recess, shall not take other measures respecting the disposition of those troops.

This act left the United States without an army. The sentiment against the maintenance of a standing army, inherited from our liberty-loving ancestors of the British isles, was from the very beginning strongly developed. Besides, the immense armaments of Europe were considered absolutely unnecessary in a country widely separated from possible enemies without. So that at the utmost, all that could be necessary would be a police force to protect our frontier from the savages. This idea has grown with our growth and remains to-day stronger even than at the end of the revolutionary war.

Until 1787 the emergencies of frontier savage warfare were met by calling upon the different states for levies, which were rapidly assembled, and having accomplished the object of the assembly, dispersed to their homes.

In 1797 war became imminent with France, and in 1798 the President was authorized to raise a provisional army of 10,000 men, with the necessary general and staff officers. In this act a physician-general was provided for, with the pay and emoluments of a lieutenant-colonel, which office was

filled by the appointment of Dr. James Craik, of Virginia, who it will be recalled was a medical officer in the revolution, and the personal physician of General Washington. It is interesting to observe at this time that the Hon. James McHenry, Secretary of War, who had served as a surgeon in the revolution, and well understood the importance of sanitary organization, wrote as follows:

The Secretary does not discover in any of the acts the necessary provision for the appointment of hospital officers or a hospital establishment. As military hospitals are indispensable to an army, especially in time of war, it is respectfully suggested that provision on the subject ought to be made by law, and that the regulations to be found in the resolutions of the old Congress, more particularly those under date of September 30, 1780, and January 3, 1782, as certainly the faithful results of much experience, may afford some important lights respecting this department. The certain consequences of disregarding so essential a measure in the event of war, and the encampment of an army, will be a train of diseases which must cut off a large proportion of our troops.

In consequence of this letter, Congress in March 1799, passed an act to regulate the medical establishment, which in its general features resembled the law of 1782. Fortunately, war did not result, and on the 15th of June, 1800, the troops, with certain exceptions, were disbanded, leaving in 1801 but 6 surgeons and 7 surgeon's mates, without any corps organization, Physician-General Craik having been mustered out.

With our extending frontiers, the necessity for an additional increase in the frontier police force became apparent, and surgeon's mates were from time to time added, until in 1804 the number was increased to 29. In 1808 various events occurred of a hostile character on the part of Great Britain which impressed the authorities with the necessity for increasing the forces against hostilities which seemed inevitable.

In point of medical organization, matters had not advanced since the revolutionary war. Nothing apparently had been learned from the vexatious controversies and sad failures of that war. The medical department remained without a clearly defined organization, with the certainty that the same

conditions would obtain in the pending war that had obtained in the previous war with Great Britain.

On January 11, 1812, Congress enacted that there should be appointed such number of hospital surgeons and mates as the service might require, with one steward to each hospital. It was the same old story: the experiences of the war of the revolution had been forgotten. No efficient army organization had been kept up; the staff departments were such as would be required for a force of but a regiment or two, without a central organization or system. Particularly was this true of the medical department, which had for all these years been represented by a few physicians scattered over the country, who were indeed physicians—not medical officers. The surgeons of the revolutionary war had left behind practically no record of their experiences in that war, nothing of the management of military hospitals, the police and hygiene of camps, the diseases peculiar to troops, and the surgical conduct of a campaign; so that in all essentials it was necessary to begin *de novo*. Speaking of the difficulties which had to be encountered, Dr. James Mann, chief surgeon of the northern army, wrote:

The mere organization of hospitals was the least perplexing part of duty. The ill defined powers with which the hospital surgeons were invested, even in their own department, subjected them to many disagreeable interferences of the officers of the line. Collisions will always exist between officers of different departments of an army, when their several powers and duties are not explicitly pointed out. Officers tenacious of authority assume as much as may be implied by rules and regulations. In addition to multiplied embarrassments, the various duties attached to the office of hospital surgeon with those merely professional, were always so pressing that little time was allowed to record particularly the diseases and medical transactions of the army, as they occurred.

The average number of men in the northern army during the summer of 1812 was 2,000, of which about 6 per cent were constantly sick from digestive disorders. No proper hospital accommodations were provided, and the sick were treated in tents. Later, hospitals were established along the northern

frontier, at Burlington, Vt., Plattsburg, Malone, and Buffalo, N. Y. Speaking of conditions obtaining at that time, we find the statement that—

The diseases of the troops composing the eastern division of the army were, as at Greenbush, intestinal disorders, to which was added in October the measles, which prevailed with such severity that nearly one-third of the total strength of the command was sick in November. As the winter advanced, pneumonia of a sthenic type became prevalent along the whole frontier, and there were upwards of 400 deaths from this disease alone during the winter in the two hospitals at Plattsburg and Burlington. It was especially noticed by the surgeons that those regiments suffered the most in which discipline was lax; the light artillery regiments had fewer sick than any other. Their quarters and encampments were generally in the best state; the men were mostly neat and clean in their dress and appearance. Of another case Dr. Mann remarks: There was one regiment on the frontier, which at one time counted 900 strong; but was reduced by a total want of good police to less than 200 fit for duty in the course of two months. This regiment in its appearance was at that time dirty in the extreme. * * * * * At one period more than 340 of this regiment were in hospital; in addition to these a large number were reported sick in camp. At the close of the war this regiment had established a high reputation. Its good discipline and bravery were excelled by none.

Fortunately the hospitals were abundantly supplied with everything necessary for the comfort of the sick, and the essential fault lay in the lack of proper organization. The experience in the campaign of the autumn and winter of 1812 and 1813 convinced Congress of the necessity for a more thorough organization of the staff departments, which resulted in the law of March 3, 1813, section 7 of which reads:

SECTION VII. And be it further enacted, That for the better superintendence and management of the hospital and medical establishment of the army of the United States, there shall be a physician and surgeon general, with an annual salary of \$2,500 dollars, and an apothecary general, with an annual salary of \$1,800; whose respective duties and powers shall be prescribed by the President of the United States.

Under this act, James Tilton, of Delaware, was appointed physician and surgeon general. At the time of the outbreak

of the war this officer wrote a work entitled "Economical Observations on Military Hospitals, and the Prevention and Cure of Diseases incident to the Army," in which he elaborated the plan for hospital organization presented by him to Congress in 1781. A review of the book which appeared in the Medical repository for 1813, says:

Dr. Tilton does not distinguish medical officers into physicians and surgeons, but considers them one or the other as circumstances may require. He proposes to establish a medical board in each military district or separate army, to be composed of two or more hospital surgeons and several regimental surgeons. This board is to have a field officer to sit as chairman, and meet monthly or oftener if necessary, by general order, to regulate the concerns of that department. This board is to examine and appoint all candidates for vacancies of hospital and regimental mates, with the consent of the commanding officer; to examine candidates for hospital surgeons, and recommend them to the physician and surgeon general for appointment, and establish rules for the medical department. The oldest hospital surgeon is to be the director of general of regimental hospitals in the army or district where stationed, and to act as prescribing surgeon only, without interfering in commissarial duties. His attention will thus be drawn to visit the several establishments for the sick within his charge, and as director to superintend their concerns. Such an arrangement is to prevent impositions on the government, and hereafter to procure surgeons adequate to their respective duties.

Instead of establishing extensive and costly buildings for hospitals, Dr. Tilton proposes to extend the circle of regimental practice and diminish the scale of hospital practice; thus if possible to prevent disease and ward off infection. His object is to have a harmonious understanding between the surgeons of the army, and by a proper regulation of the medical board, keep in check any disposition to throw the sick into general hospitals beyond moderation and propriety, whereby they must become crowded, producing the inevitable consequences of camp, jail, typhus, or hospital fevers, from which armies have suffered more than from their enemies.

Immediately after the passage of the above-mentioned act, the President caused to be issued rules and regulations for the army, those governing the interior economy of the medical department giving to the surgeon general power to

make rules for the government of hospitals, to appoint hospital stewards and nurses, to receive returns for medical supplies, etc., and for the sick in hospitals. These regulations also prescribed the uniform for the medical department.

The war of 1812 brought the same story of suffering. Surgeon Mann of the northern army wrote in 1813 during the month of August, as follows:

During the month of August an uncommon proportion of the army were sick or unfit for duty. More than one-third of the soldiers were on the sick reports. The officers shared with the privates in the prevailing diseases. Half of the medical staff attached to regiments were also unable to perform their duty. Of 7 surgeon's mates attached to the hospital department, one died and three had leave of absence by reason of indisposition; the other three were for a short period sick. So general was the sickness, the few remaining surgeons could not do full justice to their patients. At the time when the returns of the sick in the general hospital counted between 600 and 700, there were only three surgeons of this department present for duty. At this period of General Boyd's command, the troops were under excellent discipline, the encampment in good condition, and the men neat in their apparel. The general and regimental hospitals were reported during the summer months by the inspectors of the army, "in the best possible order."

The general hospital at Burlington, Vt., which was established by Surgeon Lovell, later under the command of Surgeon Wheaton, and ultimately of Surgeon Hunt in 1814, was apparently one of the best regulated of the military hospitals of that war. The history of this hospital bears evidence to the fact that zeal and intelligence, even under adverse circumstances, will bring satisfactory results, and that, after all, the man behind the hospital determines its efficiency or non-efficiency.

In December, 1814, a general order was issued from the War Office establishing regulations for the army, in which document the duties of the medical officers are for the first time clearly defined, under the headings, Hospital Surgeons and Mates; Hospital Stewards and Ward-masters; Regimental

Surgeons and Mates; Post Surgeons; Apothecary General and his Assistants; Miscellaneous.

With the close of this war, the army, including the medical staff, was again reduced, the surgeon general was retired to private life, and the central organization ceased to exist.

I cannot close this period of our history without inviting your attention to the following extract from a letter of Surgeon James Mann, medical director at Plattsburg, addressed to Surgeon General Tilton:

In events of high importance it is seldom the medical staff are noticed. This is discouraging to the ambitious young surgeon of the army. It may be alleged that surgeons being non-combatants are out of danger. This, however, is not always the case. During the investment of Plattsburg by the enemy, the surgeons were constantly passing from fort to fort, or blockhouse to dress the wounded, exposed to a cross-fire of round and grape shot; while the greater part of the army were covered by fortifications. The cool bravery of the surgeons was in private conversation noticed by the commander-in-chief; had half as much been reported to the War Department respecting them, they would have felt themselves amply compensated. While making this observation I do not include myself; because I was snug on duty at Crab Island, out of much danger while our fleet continued master of the lake. If reports honorable to officers are founded upon good conduct and cool bravery, who more deserving than the non-combatants? They have fewer motives to excite them, and are equally exposed to danger as officers of the line, whose minds as well as bodies, are constantly exercised by their commands. If any officer has hardships attached to his office, it is the surgeon who executes his duty with fidelity and assiduity.

I feel myself bound to report with much respect the conduct of all the medical gentlemen attached to this army, who have at all times during this campaign performed their duty; and who for their particular services during and after the investment of Plattsburg by the enemy, merit the applause of the country.

To discriminate would be an act of injustice. Doctors Lawson and Mason, surgeons of regiments, Warmsley, Beaumont, and Hugo, surgeon's mates, have all deserved well of

their government. I would particularly mention Russell, hospital surgeon's mate, and Low, assistant apothecary general, (who volunteered his services,) for their attention and professional abilities at a time when the wounded of both fleets and army were placed under my charge; on whom were performed immediately after the action more than 30 capital operations. It is with much pride this opportunity is improved to state that the medical gentlemen of our army and navy were not inferior but superior to the medical gentlemen of the British navy; several of whom were made prisoners of war, and assisted to dress the wounded of their own fleet. This circumstance is very flattering to our infant medical institutions; and is good evidence, they are not less respectable than the ancient schools of Europe.

During many years following the war of 1812-15, the same patch-work legislation regarding the Medical Department continued. Appreciating the serious effect such had on the efficiency of the service, not only in the medical department but the entire army, numerous communications and reports were submitted from time to time, the most important of which was that of Dr. Joseph Lovell, chief medical officer of the northern department, written in 1817, giving in detail the causes of disease in the army and the duties and responsibilities of the medical officer. This report is well worth quoting in extenso, did time and space permit.

In 1818 Congress awakened to the necessity for a reorganization of the army, and passed a law reorganizing the general staff, which, so far as relates to the medical department reads as follows:

SECTION II. And be it further enacted, That there shall be one Surgeon General, with a salary of \$2,500 per annum, one assistant surgeon general with the emoluments of a hospital surgeon * * * * and that the number of post surgeons be increased not to exceed eight to each division.

Following this, the various incongruous offices of regimental surgeons and mates, hospital surgeons and mates, post surgeons, and assistant surgeons, were consolidated into a more homogeneous corps, resulting in general good, but in some personal discrimination which was the cause of much dissatisfaction.

On April 18, 1818, Surgeon Joseph Lovell was appointed Surgeon General of the army, Surgeons Tobias Watkins and John C. Bronaugh were made Assistant Surgeons General, and Francis Le Barron, Apothecary General, and James Cutbush and Christopher Backus Assistant Apothecaries.

Surgeon General Lovell was born in Boston in 1788. His grandfather was a distinguished patriot, taking a prominent position in the war of the revolution. The grandson was educated in Boston, graduating at Harvard University in 1807, and entered the army as surgeon of the 9th Infantry. He showed great ability during the war of 1812-15, and his appreciation of the requirements of the service as evidenced by his able reports on the various subjects connected therewith, indicated him to be the fittest person to assume the organization of the new department, and history tells us his appointment gave the greatest satisfaction to the army at large and to the medical staff.

It is not strange to find that the first point which attracted the new surgeon general's attention was the necessity for a revision of the medical regulations. Those of 1814, which were a decided advance in that they were something definite, were unfitted to the new organization of the corps. The nomenclature of diseases was so vague as to afford no reliable data on which to base an opinion as to the health of the army. The duties of medical officers and their relation to the new bureau required to be clearly expressed; the appointment of the assistant surgeons general as inspecting officers of the corps demanded attention to the subject of medical inspection, which had hitherto been to a great extent left optional with the directors of departments and divisions.

The new regulations were issued September 8, 1818, and their good effect was speedily seen in the improved character of the reports forwarded by the medical officers and the testimony received as to the increased efficiency of the department. These regulations, which prescribed in detail the duties of the different officers of the department, will bear close study. It is interesting to observe that they contain a prohibition

against the officers of the corps engaging in private practice. Although incorporated in the regulations of 1814, it had never been enforced. In fact, the position of the frontier posts and the comparative scarcity of physicians, 80 or 90 years ago, demanded, as an act of humanity, that the medical officer should professionally assist the citizens in the neighborhood of the garrison. Upon this subject General Lovell wrote that the regulation forbidding army surgeons to engage in private practice was intended to prevent neglect of-duty by entering extensively into it. He adds, "There would be no objections to this practice provided the officer desiring it would make an application to the Secretary of War through the Surgeon General, setting forth clearly the circumstances." The question of private practice is one that has been the occasion of a good deal of unfavorable comment on the part of line officers and of complaint on the part of civilian practitioners, so that the rule may be safely laid down that, except in cases of emergency or consultation, medical officers of the army should not engage in private practice.

When first called upon for a report, in November 1818, General Lovell made numerous recommendations, the principal one of which was that the pay and number of medical officers be increased. It may well be imagined that the indefinite status of army surgeons up to this period had created many misunderstandings and much dissatisfaction. They were in the army but not of it. They were without rank and had few rights that any one was bound to respect. In 1819 the question of quarters became so imminent that the following order was issued:

ADJUTANT AND INSPECTOR GENERAL'S OFFICE,

March 22, 1819.

General Orders:

The Medical Department of the army will be governed in their relative rank as follows:

Surgeons of regiments will have precedence over post surgeons, and post surgeons will have precedence of regimental mates; in their several grades, further reference will be had to date of commission.

In their choice of quarters, the Medical staff will have

precedence of subalterns, under the direction of the commanding officer (who may always claim precedence of those under his command).

Medical and hospital supplies are not to be detained or diverted from their destination, except by generals of division and commanding officers of departments, in cases of emergency and absolute necessity, when a report will be promptly made to the Adjutant and Inspector General, that further orders for deficiency may be given.

While the act of 1818 has generally been considered as the commencement of the modern history of the medical corps of the U.S. Army, it was really not until the reduction of the army in 1821 that it assumed the form which it has retained without any decided alteration to the present time.

The history of the Medical Department from this time to the declaration of war against Mexico though not eventful, is a record of arduous and irksome duties during active hostility in the unhealthy stations in the cypress swamps of the everglades of Florida.

From time to time laws were passed by Congress which in certain respects modified the organization. In 1825 a law was enacted which specifically provided that no one should receive an appointment as assistant surgeon until after an examination by a board of three medical officers, detailed by the Surgeon General, which however was not put into practical operation until 1832, when an order was issued fixing the requisites for appointment. This same year a regulation was promulgated authorizing medical officers to be detailed as judge advocates of general courts martial.

It can be readily imagined that the question of pay and emoluments of medical officers had become of serious importance. The demand for men of a high grade of professional attainment made by the examining board was inconsistent with the emolument then paid. The expenses of medical officers at frontier posts were very great. They had no extraneous sources of income in the way of private practice and their compensation remained the same as that fixed in the Act of 1808, while the nature of their duties had been greatly extended by subsequent enactments. In the line of the army

during this time there had been a considerable increase in the pay, but not so in the Medical Department. The result was that resignations became so frequent as to seriously impair the efficiency of the department. The Surgeon General made frequent reports and recommendations upon this subject, calling the attention of Congress and military authorities to the injustice to the officers and the serious results to the service in the failure of Congress to properly remunerate medical officers, in which he did not forget to state that the medical officer was required to be a regular medical graduate as a prerequisite to appointment in the department, and that all of the expenses of a liberal education including a collegiate and medical course were paid by himself; while on the other hand a military cadet who ultimately becomes an officer of the line and other staff corps is prepared for service at public expense. Still Congress did not respond. Honorable Lewis Cass, Secretary of War in 1831, says of the medical department: "There is no portion of the army whose compensation is so inadequate nor is there any which presents less prospects of reward." Again in 1831 he wrote: "The prospects of gradual and continued promotion held out to the other officers of the army, is a powerful incentive to good conduct, and when realized becomes its just reward. Of this the medical officers are deprived, for the slight difference in rank and pay at present existing is scarcely worthy of consideration; the nature of their profession requiring time, experience and pecuniary means for its acquisition; the responsible and arduous services demanded of them; the relation, not always a pleasant one, in which they stand to the line of the army; and I may add in justice to this meritorious class of officers their general capacity, respectability and good conduct, entitle them to a higher rate of compensation." Even the line of the army appreciated the inviduous distinction made against the Medical Department, and presented petitions to Congress, asking regulation of its claims, of the most convincing character. Notwithstanding this it was not until June, 1834, Congress finally passed a bill increasing and regulating the

pay of the Medical Department, which reads as follows:

SECTION I. Be it enacted, etc., That from and after the passing of this act, no person shall receive the appointment of assistant surgeon of the army of the United States, unless he shall have been examined and approved by an Army Medical Board, to consist of not less than three surgeons or assistant surgeons who shall be designated for that purpose by the Secretary of War; and no person shall receive the appointment of surgeon in the army of the United States, unless he shall have served at least five years as an assistant surgeon, and unless also he shall have been examined by an army board constituted as aforesaid.

SECTION II. And be it further enacted, That the surgeons in the army of the United States shall be entitled to receive the pay and emoluments of a Major; and the assistants surgeons who shall have served five years, shall be entitled to receive the pay and emoluments of a Captain; and those who shall have served less than five years, the pay and emoluments of a First Lieutenant; and that said assistant surgeons shall be entitled to receive the same allowance for forage as they are at present entitled to.

SECTION III. And be it further enacted, That every surgeon and assistant surgeon who shall have served faithfully ten years in these grades respectively, shall be entitled to an increase of rations per day, equal to the number of rations to which he may be entitled under this act."

In the mean time, during several years preceding the passage of this law, the usual efforts were made to reduce the army, with a view to economizing the public expenditure. While such a course is most laudable if properly directed, it must be realized that the first consideration should be efficiency, and no army, or department thereof, that is not thoroughly efficient is of much value. In support of this position many reports were submitted by the Surgeon General, which apparently were not altogether acceptable, for it appears that the Secretary of War not only failed to appreciate them, but in an elaborate report on the subject of our army organization, the only reference he made to the Medical Department was as follows:

The Surgeon General of the Army might be dispensed with. He has no disbursements to superintend or make, no bonds

to receive, no accounts to revise or responsibilities to encounter. The principal and material duty to be encountered by him is in the purchasing and distributing of medicines, a duty which is performed by a quartermaster of the army at New York, at which place medical supplies are obtained, and from which point they are distributed to the several posts.

It may easily be imagined that this recommendation was keenly felt by General Lovell, and in reply thereto he addressed a communication, which was transmitted to the House of Representatives, through the Secretary, in which he gave the history of his department since his appointment. Fortunately the Secretary's recommendation did not prevail.

Although the regulations of 1825 provided for examination for appointment in the Medical Department, as previously stated, it was not until December 13, 1832, that a board was convened for the examination of candidates for appointment. This board assembled in New York, where it continued with varying personnel to meet in annual session from that time until the organization of the Army Medical School in 1893, since which time it has met in Washington. The necessity for a strict physical and moral examination, although such was not at first demanded, soon impressed itself upon the members of the board and resulted in the promulgation of a rule which required the examiners to take into consideration the physical qualifications and moral habits as well as the professional requirements. In this connection I venture to quote from the report of the President of the Board:

In ascertaining the professional attainments of candidates it became at first the duty of the Board to decide on the mode of conducting the examinations. The most important step was to arrange the branches in which examination should be held.

As the branches of practical medical science are now conventionally and very positively established, there was no difficulty or doubt in arranging them.

They were divided by the Board as follows:

1. Anatomy and Physiology.
2. Surgical Anatomy, the Principles of Surgery, Operative Surgery.

3. The Theory and Practice of Medicine.
4. Obstetrics.
5. Materia Medica and Pharmacy.
6. Chemistry.
7. Medical Jurisprudence.

That the first three divisions are essential to the army medical officer none can doubt. It was therefore required that in all these branches the attainments of the candidates should be unquestionably respectable. The fourth division, Obstetrics, refers to a class of patients not recognized by army regulations as within the specified duties of a surgeon. Yet universal usage, the dictates of humanity, a high sense of professional pride and duty concur to place the families of officers and soldiers in a moral relation to the army surgeon deeply interesting to them and him; binding him to them as strongly as though that relation were of military obligation. Nothing can add to the interest which the good surgeon feels towards that class of persons; therefore Obstetrics becomes an important branch of practical medical science in the view of the Board. Of Materia Medica it suffices to say, that to be properly acquainted with surgery and practical medicine implies a suitable knowledge of the articles used in treating injuries and disease. Therefore examination was not so minute in this branch as in the preceding. The candidates were questioned almost exclusively on what is termed Medical Chemistry; and Medical Jurisprudence was referred to only as it practically involved the interests and fate of its subjects.

It will be hence seen, that if to some branches primary and essential importance be ascribed, from no recognized branch of practical medical science was due or relative consequence withheld. The relation strictly maintained, was that of foundation and superstructure.

The examinations were long and patiently conducted. Two sessions were allotted in every case except one, and part of three days were given to that case.

Every effort was made to render the examinations unembarrassing. Perspicuity and precision were constantly studied; and in no instance was the candidate occasioned the least perplexity. It was well ascertained that the scope of every question was perfectly understood by the candidate. It was a leading feature in the examination that they were confined to subjects of practical importance. All speculative or abstract discussions were avoided.

It was stated to the candidates that in answering ques-

tions and in giving their opinions, they might refer to any respectable authority; and that the board would highly regard inferences drawn from experience. Liberality on these points was not at all incompatible with an exercise of the critical judgment of the Board. The examinations were minute, because positive and particularly because relative merit could only be thereby duly developed.

Finally, the examinations were thus plainly, impartially, practically and deliberately conducted, that the candidate if rejected, might *be convinced of his own incompetency*. That this expectation was not unwarrantable is fully established by several cases.

In illustration of this point, and to anticipate somewhat, I will read a letter addressed to the Secretary of War by Surgeon General Lovell of the date of August 12th, 1837.

In reply to your question touching the nature of Dr. N—'s complaint, I have to say that from his communication I cannot exactly discern what he means or what he wants.

All that I can learn from his incoherent language is that the Army Medical Board and himself are at variance in opinion as to his talents and attainments, and that he has raised a complaint against the Board for not accepting his word and the negative testimony of his friends as evidence of his qualifications to practice physick and surgery in the army of the United States. Dr. N— has brought himself to believe that the letter of invitation to appear before the Medical Board is a letter of appointment; that the examination is a mere matter of form not at all calculated to affect the appointment; and that the Board has done violence to his rights as a citizen in withholding from him a passport into the army. Under this view of the subject he has conceived the idea of forcing his way into the army through the medium of political influence, and hence these threats of vengeance, this show of violence. Dr. N— has however no cause of complaint nor ground upon which to base a charge against the Medical Board; and his murmurs can be silenced and himself strangled to death without an effort on our part. If faint praise can dam a man, he was completely cursed by those who pretended to recommend him to the consideration of the Department, and should not have been taken up as an accepted candidate for appointment to the Medical Staff of the army.

Dr. N— has been twice examined and in both instances greatly failed, and from my own knowledge of him I am free to say, that he can never reach the lowest niche even on the

standard of merit which has been reared by the Army Medical Board.

In 1832 the Black Hawk war occurred, which was known as the cholera campaign and during which this disease was very widely disseminated throughout the country through the instrumentality of the troops. The history of this campaign from a medical standpoint is most interesting and will bear close study.

In 1835 occurred the Seminole war, following the Dade massacre. Troops were hurried to the scene of hostilities from all parts of the country. It is interesting to note that a regiment of volunteers was raised in Louisiana of which the then Surgeon Thomas Lawson was offered and accepted the Lieutenant Colonelcy, in which position he rendered efficient service. At the muster out he was assigned as medical director in Florida. As usual, in consequence of the war, the demand for medical officers was very great and many posts throughout the country were deprived of medical attendance to meet the necessities of the troops in the field. This having been brought to the attention of Congress eight additional medical officers were authorized by act of July, 1836. The accomplishment of this was almost the last official act of Surgeon General Lovell, who died on the 17th of October of that year. Throughout his official career he had gained the universal respect, admiration and affection of all with whom he had associated. In 1842 the officers of the medical corps testified their appreciation of his virtues by the erection of a handsome monument over his grave in the Congressional cemetery here.

The army almost as a unit desired the appointment of Surgeon Thomas Lawson, then senior surgeon, as surgeon general in succession to General Lovell. Very many of the officers including all those of high rank united in petitions to General Jackson to appoint Dr. Lawson. At length on the 30th of November, 1836, he received the appointment, much to the satisfaction of the officers of his corps, who had been extremely apprehensive that the great political influence that

had been brought to bear would result in the appointment of some one from civil life. General Lawson, however, did not enter upon the duties of his office until the spring of 1837; he having been ordered in the meantime by the War Department to organize a battalion of New York and Pennsylvania volunteers for service in Florida. His admirable record, large experience in all departments of the service under all circumstances gave great promise of his value to the Medical Department of the army in his new position. How well this promise was fulfilled may be learned by study of the history of the department under General Lawson's long administration.

In 1840 a new uniform was adopted for the medical department. The board which recommended this uniform had at first given the medical officer the aiguillette, but not epaulettes. To this many of the medical officers strongly objected and appealed to General Lawson, who addressed the Adjutant General of the Army as follows:

Dr. King informs me that you have expressed a wish that I should call with him on the Secretary of War, and speak to him on the subject of epaulettes for the Medical Staff.

As it is unusual for a subaltern officer to dictate to his chief, I have upon reflection come to the conclusion that it is better for me not to suggest anything to the Secretary in relation to a change of uniform.

I have been twenty-six and more years in the military service of my country, and very generally with troops on the frontiers and in the field.

I have been on the theatre of immediate action in every war in which the country has been engaged within my period of service, whether with a civilized or savage enemy, except that with Black Hawk, and then I volunteered my services for the field, but could not obtain permission to leave my station.

I have acted as quartermaster and as adjutant, and have been for months at a time, in command of a company of men in the regular army. I have also commanded a battalion and a regiment of men in the volunteer service, and have led them to the theatre of war; in the first instance under a commission from the executive of the State of Louisiana, and on the last occasion by the almost unanimous consent of the officers and

men who served under my orders; and although my services have not been attended with such brilliant results as those of some other persons, my military career has certainly not been discreditable to myself, or altogether unprofitable to the government.

If under these circumstances the commanding general of the army could feel himself justified in putting me off with an aiguillette, a piece of tinsel on one shoulder, while he decorates every brevet second lieutenant with an epaulette on each shoulder, and the staff lieutenant with an aiguillette besides, I must be satisfied to remain without a military dress.

As I am a soldier in feeling and somewhat in practice too, I should be gratified with having the privileges of a military man in the way of dress even; but if I am never to wear an epaulette until I ask for it, my shoulders will never be decorated with that badge of distinction. All that I have to ask is, that I shall not be compelled to wear the prescribed uniform, a demi-military dress, alike unsuited to my taste and to my feelings, nor forced to follow in the train of a general officer, on gala days, or in procession. As a citizen with plain clothes on, I can command respect, and feel that I am respected; but to be brought in contact with military men, on certain occasions, with half a uniform on, and the only chief of a military bureau in the same predicament, I could not but be conscious of my inferiority, and must therefore beg leave to be saved from the necessity of experiencing such a state of mortification.

The subject of a new uniform was broached by me the other day, at the pressing instance of a number of members of the medical staff; and as these officers are constantly present on duty with the soldiery, many of whom are not disposed to pay homage to, or yield prompt obedience to any person who does not wear the badge of military rank, the good of the service would seem to call for a respectful consideration of their application for a strictly military dress.

The rigid rules of military service having been already dispensed with in order to decorate the persons of platoon officers with two epaulettes, who before were entitled to one only, either on the right or left shoulder, there can not be any great military impropriety in extending the indulgence to those staff officers, who, although they have not military rank proper, must in the regular discharge of their duties necessarily command, or have military control over non-commissioned officers and privates, and also over the commissioned officer when sick and in hospital.

Epaulettes would embellish the person, and thereby gratify the pride of these officers (whether foolish pride or not is immaterial to the question) without doing a jot of injury to the discipline of the army, or interfering at all with the rights or with the dignity of a single officer with military rank. And if these indispensable officers, and I am free to say, intelligent, zealous and efficient members of the Medical Corps (the surgeons and assistant surgeons) can be brought to set a higher value on their commissions, or to feel better satisfied with their condition in the army, at so small a cost as the privilege of wearing epaulettes, the indulgence surely should not be withheld.

This remonstrance had the desired effect, for on the appearance of the new uniform regulations the coveted decoration was procured for medical officers as well as the other officers of the army.

At the close of the Florida war in 1842, the Medical Department was reduced by two surgeons and ten assistant surgeons.

It may easily be imagined that the question of relative status of Medical Corps versus Line and other corps had from the organization of our army—as in all armies—caused no little friction. The official relation of the medical officer was at this time by no means well defined. He was without actual rank and the definition of assimilated rank was never made clear. Regulations prescribed that on certain boards and councils line and staff officers should be detailed. The line claimed that medical officers having no actual rank could not preside over such councils as that involved exercise of military command which they were forbidden by law to have. In the revision of the statutes of 1840 there was incorporated a paragraph which expressly denied the right of any staff officer to preside over a board of survey or council of administration, though they were still liable to detail as members. This resulted in an indignant protest from officers not only of the Medical Department, but of the line, and resulted in a very vigorous letter from the Acting Surgeon General under date of November 4, 1841. For a number of years this continued to be a burning question eliciting very able papers from some

of the most distinguished members of the corps, notably, Mower, Tripler, and Heiskell. This was a formative period during the piping times of peace when the small things of life became unduly important. For example, the question of salute was decided as follows: Surgeons are by regulations classed with majors in regard to certain matters of allowance as quarters, etc., and they are entitled to precedence as such in mixed boards; but not having the military "rank" of "field officers," they are not entitled to the salute prescribed for majors. The position of medical officers on parade for muster, inspection, reviews, etc.; whether it has been customary for the medical officer to appear in full dress at parade and for punishment of prisoners, etc., etc. In 1845, the question of the propriety of a medical officer engaging in private practice, was brought to the notice of the department to decide, in consequence of a protest forwarded by private physicians at Sacket's Harbor. These protests were replied to by the Acting Surgeon General as follows:

Your communication, without date, to the Secretary of War, representing that Dr. Foot, the surgeon stationed at Madison Barracks, and Mr. Veits, the hospital steward of the post, come in "competition" with you in the practice of the adjacent village and country, and asking for the interposition of the Department of war in the matter, has been referred to this office.

Whether, by your expression, "putting themselves in competition" with you, you mean to convey anything more than that they comply with the applications of those who desire their professional aid, is not clearly understood. If neither a breach of professional etiquette, nor any improper means to obtain professional employment is charged against them, it is not perceived that this Department can with propriety interfere in the matter. In the absence of reasons such as have been stated, the only other, and indeed the principal circumstance that would seem to call for the restraint of authority in the present case would be, that they neglect or have neglected their official duties by engaging in private practice. This you have not alleged; and as no report has been made upon the subject by their commanding officer, it is to be presumed there is no cause for complaint on that score. Indeed the elevated character and fidelity of the officers of the Medi-

cal Staff afford satisfactory guaranties that this will seldom, if ever occur. If, however, they should so far forget what is due to the government and expected of themselves, as to engage in private practice to the neglect of the officers and soldiers who are dependent on them for medical aid, they can be readily checked by their immediate military commander; and if they should persist in this dereliction of public duty, they can promptly be brought to trial before a military tribunal.

When therefore, it does not interfere with their military duties, medical officers have a right to give their professional advice, etc., to whomsoever they please, and they have always been permitted to do so with a view to their professional advancement. Indeed at military posts occupied by a small number of troops, and where of course the subjects of disease are few in number, and the complaints of these few present but little variety of character, it is rather desirable than otherwise that the army physician should extend his sphere of action to the citizens immediately around him, so as to become familiar with disease under all circumstances, the maladies prevailing throughout the country and among the citizens generally, as well as the diseases peculiar to the soldier, or to military life in camp or garrison. To deprive the army surgeon of any reasonable opportunity of practical advancement in his profession, would surely be inflicting an injury upon the service generally, and especially upon those who have to depend upon him for professional aid.

Again, while this Department in its reply to your communication desires to confine itself strictly to official considerations, or such as affect the public service merely, it may not be out of place incidentally to state, that to prohibit a medical officer (when his public duties will permit) from extending relief to those of his fellow citizens who may apply for his services—having confidence in his professional attainments—would be as ungracious to them as it would be devoid of the common dictates of humanity; and might afford as just and perhaps a better cause for complaint on the part of the neighboring community than the one alleged by yourselves, which relates exclusively to private interests.

In reply to your proposition that you may be permitted to come in competition with them (the surgeon and steward) inside "the garrison", and "the amount of our (your) services to be deducted from their pay", I beg leave to say that as there are generally a number of persons at a military garrison, who receive the professional services of the surgeon only by right of courtesy (which has always however been regarded as ob-

ligatory), they are entirely at liberty if they think proper to employ you; and as far as the discipline of the service will permit and my jurisdiction extends, I can offer no objection to their so doing; but as the pay of the surgeon and steward is fixed by law, it is not competent for the Department to order you to be paid for your services in the manner you propose."

But the period of small things was rapidly passing. The threatening aspect of affairs with Mexico necessitated the concentration of a large body of troops on the border, and all was activity.

On the 13th of May, 1846, President Polk issued a proclamation announcing to the people of the United States that Congress had declared "By the act of the Republic of Mexico, a state of war exists between that government and the United States."

The history of this war is one of interest to the students of military sanitation and much in it could be found to reflect great credit upon the medical officers of the army, not only as military sanitarians, but as soldiers. The act of May 13, '46, called for fifty thousand volunteers which were to be supplied with medical officers on the basis of one surgeon and one assistant surgeon to each regiment. In December of that year Surgeon General Lawson left Washington for New Orleans on official business. On his arrival in the latter city he was invited by General Scott to accompany him on his projected campaign in Mexico as chief of his medical staff; an invitation which was promptly accepted. During his absence from Washington, Surgeon Heiskell performed the duties of Surgeon General.

On the 11th of February, 1848, was passed the most important law since the organic act of 1821. This act reads: * * * subject to the provisions of an act entitled "An act to increase and regulate the pay of the surgeons and assistant surgeons of the army, approved June 30, 1834;" and that the officers whose appointment is authorized by this section, shall receive the pay and emoluments of officers of the same grades respectively; and that the rank of officers of the Medical Department of the army shall be arranged on the same basis which at present determines the amount of their pay and

emoluments; Provided, That the medical officers shall not in virtue of such rank be entitled to command in the line or other staff departments of the army.

The proviso of this act would seem to be superfluous. No staff officer can command unless specifically assigned to command by the Secretary of War. As to the legal right of the Secretary to assign medical officers to any duty which in his judgment they can perform,—that was settled by the act approved Oct. 1, 1892, which reads:

"That medical officers of the army may be assigned by the Secretary of War to such duties as the interests of the service may demand."

The regulation covering this point, paragraph 18, remains the same to-day as it was in the beginning. It may be interesting to observe that medical officers neither claimed nor desired any right to command outside of their own department. They did, however, demand the same right of independence within their own department that was extended to other branches of the service and the recognition that a medical officer was something more than a civilian employee of the government authorized by courtesy to wear a uniform. This bill for the first time placed the medical department on an equality with the other staff departments.

I have thus far been unable to find any detailed accounts of the methods of organization and administration of the medical department during this war. There were general hospitals; presumably regimental hospitals; probably brigade hospitals. There was no less sickness in this campaign than others of which we have record. Apropos to this I venture to quote in extenso the report of Surgeon R. S. Satterlee, one of the distinguished officers of the medical department and at that time senior surgeon of the first division:

In obedience to your instructions that I should report for the information of the General-in-Chief the probable causes of the great amount of sickness and mortality prevailing among the troops, I proceed to state that sufficient causes of disease exist, and have existed since and during the siege of Vera Cruz, to account for all the sickness that prevails; and not a few of these causes have been spoken of, both in the

reports of the medical officers of the first division and in their conversations and often by them deplored.

To prove the above position, it is only necessary to give a brief history of the operations and changes of the division from the time it left Vera Cruz until the present time.

1. The division left Vera Cruz with the most limited means of transportation, not being allowed to bring even their tents; in consequence of which they have been obliged to bivouac in all situations from the 'Tierra Caliente' to the cold and elevated positions of Jalapa, Las Vegas and on the march to this place. This would under any circumstances produce diseases of the thoracic and abdominal viscera from the great change of temperature, and when it is recollect that many of the men were without blankets or great coats, having improvidently thrown them away while exposed to the scorching heat of the sun in the low country, or while hurrying to the support of the advance on the day of Cerro Gordo, I think the position will not be denied.

2. The almost total change in the character of the rations issued to the troops, while on board the transports and during the siege operations before Vera Cruz. They were almost exclusively confined to salt meat and hard bread, without vegetables, so far as I know, except beans and rice, not even the antiscorbutics allowed by regulations except in rare instances. This when a march into the country was commenced, was changed for fresh mutton, pork and beef (the latter always of inferior quality), and instead of the hard bread, always considered healthy when good, in several instances flour has been issued, and since our arrival at Puebla, Mexican bread, which experience has taught us is not healthy, at least for us, and the unrestrained indulgence in crude and unripe fruits, and the vile liquors, both distilled and fermented. All this is without doubt a fruitful source of disease.

3. The quarters that the troops occupy are undoubtedly far from being healthy. Many of the rooms are low and damp, and almost without ventilation, and in many instances surrounded by high walls which exclude in some degree the fresh air; in other cases the men are quartered in long entries, through which there is a rush of cool air, rendered more unhealthy by having passed through damp places. In some instances the men are greatly crowded, nearly three times the number of men allowed by regulations for hot climates living in one room. Almost, if not all of the quarters have thick stone walls with floors of the same material, or brick, upon

which the men sleep with only a mat under them (and that but recently), and with scant covering. This the men now suffer, and did at Perote, and the first brigade and light troops of the division, while at Tepeahualeo had added very bad water from brackish wells. These things, I think can not be denied to be prolific sources of disease.

4. The unacclimated state of many of our men and their ignorance of a soldier's life. Nearly if not quite two-thirds of some corps are recruits. In one regiment that has lost fifteen men since our arrival in Puebla, thirteen were recruits, and the character of the recruits that have recently joined is of such a nature that disease and death must be expected among them. Many of them are boys entirely too young to undergo the hardships of a soldier's life, while others are old and worn out men who should never have been enlisted.

5. The great want of personal cleanliness. Many patients are received into our hospitals who probably have not washed their persons for months, and who for weeks have not changed their underclothes, and who are not only filthy but covered with vermin. This remark does not apply of course, to our old brave and faithful soldiers who are an ornament to any service, but particularly to the recruits, a great part of whom are indolent and of course filthy. Now, it is impossible for men to be healthy under such circumstances.

6. The rainy season, exposure to the warm sun in the morning and cold damp atmosphere at night, is exceedingly deleterious.

7. The great elevation of our position. The rarified air permitting no evaporation from the surface, the skin becomes dry and feverish as well as inactive, the natural excretions of the body are of necessity thrown upon the thoracic and abdominal viscera, the large glands from this over exertion and excitement become torpid and refuse to perform their functions, hence the great amount of bilious derangements, etc.

The above statements I have drawn up in obedience to your orders. I consider them to be very plain facts open to the cognizance of the most common observer who will take the trouble to investigate them. They are the concerted opinions of all the medical officers of the division and have often been the subject of conversation, as well as of official reports.

Surgeon Tripler wrote under practically the same date that in his opinion the causes of the diseases so extensively prevailing among the troops were, first, the inferior physi-

al constitution of many of the men; the rapid transition of climate; deficiency of clothing; the violent change of habits the recruit must undergo in becoming a soldier; the neglect of personal cleanliness; the unsanitary condition of quarters; inappropriate food, and finally climatic influences.

The same reasons are applicable to every war of which we have record. The yellow fever broke out with great severity at Vera Cruz; but everywhere we find commendation by the commanding officers of the excellent work done by the medical staff—Tripler, Randall, Cuyler, Keeney, Hammond, Swift, and a host of others.

Colonel Lugenbeel wrote as follows of Assistant Surgeon William Roberts at the battle of Molino del Rey:

At the battle of Molino del Rey, Doctor Roberts established his attendants in the rear of the regiment in a slight hollow, so as to be protected from the fire of the enemy. When the line was formed and advanced upon the enemy I did not notice the doctor. Very soon afterwards I saw Lt. C. S. Hamilton, fifth infantry, who commanded company "I" of that regiment stagger, and fall as if severely wounded. Assistant Surgeon Roberts ran up to him from the rear and after examining his wound said something to him and then started for the line of battle. I called to him to go back, but he pointed to Hamilton's company and ran on. The next I saw of him he was lying down on the field of battle with the wound in his forehead which afterwards caused his death. When I saw Hamilton I asked him about Robert's singular conduct, and he told me that Roberts came and examined his wound, and told him to go to the rear where his stewards and attendants were, and that he (Roberts) would run forward and take command of his company as it was without an officer.

On the 20th of August at the battle of Churubusco, Roberts attempted to enter into action with the regiment in the same manner, but I was fortunately near enough to him to capture him and send him to the rear, where Worth's division hospital was temporarily established, telling him that he was the only doctor we had and that he must not go under musketry fire.

I don't think I ever saw a doctor who enjoyed a fight more than he did, and with all of this pluck and go-ahead courage, he was as gentle as a woman, an attentive, intelligent physician and a kind hearted, good man.

Doctor Roberts had been two days before detailed for duty at the general hospital at Tacubaya, which was being organized by Asst. Surgeon Simpson, but he preferred duty with his regiment and obtained an order relieving him from hospital duty, and rejoined the fifth infantry but a few hours before the charge on the Molino. After he was wounded he was carried to Tacubaya and attended by Doctor Simpson, whose pen furnishes the following interesting account of his case:

The action commenced at daybreak, and about eight o'clock in the morning Asst. Surgeon Roberts was brought to my room in the Bishop's palace wounded in the head. He was struck by a musket or escopet ball on the temporal ridge of the frontal bone, about two inches above the left supra-orbital arch, the ball glanced, fractured and carried away a portion of the frontal bone, leaving the brain exposed; abscesses formed in the cavity of the cranium and he died in convulsions. Asst. Surgeon Roberts received his wound in the assault made by the fifth infantry on the Casa Mata, a stone work on the enemy's right. All the officers of one company having been shot down, he took command and was mortally wounded in the assault. From the Bishop's palace he was moved to Mixcoac, and from there to the house of the Minister of War in the city of Mexico, near Mineria, where he died October 13, 1847.

The final battles at Chapultepec and the gates of the city of Mexico occurred on the 13th of September, 1847. With the close of this year active operations on the part of the army of invasion terminated. The sick in the general hospitals were sent home as rapidly as possible; many of whom were sent to the large general hospitals at New Orleans which were under the charge of Surgeons Wright and Mills.

In 1848 the corps was again increased by the addition of ten assistant surgeons. The question of rank and prerogatives of medical officers was still a burning one, and decisions were constantly asked for; so much so indeed, that the attention of Congress was finally called to the matter and on the 18th of July, 1850, a resolution was passed by Congress requesting the President to communicate his views on the subject. A board consisting of several general staff officers, colonels of artillery and of infantry, Surgeon Thomas G. Mower,

and Paymaster David Hunter, was convened and presented a report with a draft of a bill, which so far as relates to the medical department reads as follows:

SECTION 5. And be it further enacted, That the rank conferred by section 8 of the act approved February 11, 1847, entitled 'an act to raise for a limited time, an additional military force, and for other purposes,' upon the officers of the Medical Department, * * * * shall entitle the officers holding such rank to choice of quarters and to precedence according to rank on courts, boards and councils, and to the military honors of that rank, and when they chance to be at a post or with a detachment commanded by a junior officer they shall not absent themselves from the post or detachment, without notifying the commanding officer, though of inferior rank, of their intention to do so.

In 1850 the corps first sent delegates to the American Medical Association.

In 1851 the uniform was again changed, and this time it was proposed to differentiate between medical officers and others by refusing to the former the sash prescribed for all others. This evoked a vigorous protest from Surgeon General Lawson, which resulted in the provision of a green sash for medical officers and which they continued to wear until the abolition of all sashes in 1872.

In the annual report of the Surgeon General for 1853 and following years, the necessity for increasing the number of medical officers was strongly urged upon Congress. Although the number of medical officers in proportion to the size of the army was large, yet the great number of new posts which were being established in the territories rendered it impossible to supply them with medical officers. Moreover, medical officers were needed to accompany detachments of troops on Indian expeditions, so that the demand was far in excess of the supply. On this subject, General Lawson wrote November 10, 1855—

The duty again devolves upon me to report that the numerical strength of the medical corps of the army is not sufficient to meet the requirements of the service. It may appear at a first glance that 94 medical officers should suffice for an

army of 19 regiments and corps of the line, with the necessary officers and men of the staff departments, the whole force numbering 17,861 men; but upon an examination into the matter, it will be found that the corps, with its present number, does not and cannot give the necessary medical aid to all the troops dispersed throughout our very widely extended territory.

The number of physicians does not depend upon the numerical force of the army, but upon the manner in which it is employed; that is, upon the divisions and sub-divisions it has to undergo, and the particular service in which it is engaged. One surgeon and two assistant surgeons will suffice for one regiment or corps of ten companies, or a thousand men; these three officers may also serve that corps divided into three battalions; but they cannot possibly render the necessary medical aid to the ten companies of the corps, each company occupying a separate post, the one 20 miles distant from the other.

Our army is spread all over the country, from the Atlantic to the Pacific oceans, occupying 89 military posts and arsenals, each station requiring one physician and some of them two. To supply medical officers to the military posts garrisoned by troops of the line, and furnish the necessary complement of physicians to serve with detachments of men constantly operating in the field, would exhaust the whole number of our regular corps, 94 in number, were they all efficient and present for duty; leaving us to supply medical aid to troops passing in transports or by land, from one section of the country to another; to the officers and men stationed in our large cities, on staff and other duties; to the many forts on the Atlantic not garrisoned, but held in charge by a few engineer and ordnance men; and to the various recruiting rendezvous, as best we can, under contract by the month, or by the day and the visit.

Officers of the medical department, however, get sick as well as other people; they are entitled to occasional relaxation from duty like other officers; and again they have a claim the same as officers of the line and other staff departments of the army, to the indulgence of a leave of absence from duty to visit their families and friends, and to attend to important private business.

With the aged and permanently disabled officers and the sick, together with those entitled to leaves of absence, our force of 94 surgeons and assistant surgeons may be considered as reduced on an average 8 or 10 per cent, or to 85 effective men for duty. At this time, however, there is but one medi-

cal officer on leave of absence; and this one has just returned from a 6 years' tour of service in the Department of the Pacific.

Within the last three years there has been paid out, on account of the employment of private physicians, \$72,520., averaging \$24,173 per annum; this last sum being about the amount of the annual pay of 24 assistant surgeons of the army. Now as we have to expend annually for extra medical attendance \$24,000 and more, or the sum of the pay and emoluments of 24 medical officers of the army, the question arises whether we shall pay out the money to private physicians, unknown to us and employed on the spur of the occasion, instead of regularly instructed and disciplined medical officers, who have been examined by competent persons and found qualified morally and physically, as well as professionally for the practice of physic and surgery in the army.

General Lawson also called the attention of Congress to the advisability of the enlistment of a certain number of competent persons to serve as hospital stewards and also the justice of paying men detailed for duty in hospital extra compensation. His peroration is worthy to be quoted in extenso:

In conclusion, I beg leave to say that the doctrine which seems now-a-days to obtain, viz: that nurses and physicians administering to the body, as well as the high personages of the church who administer to the soul of man, have to look for their reward in Heaven, for the good deeds done in this world, may be very consolatory, very satisfactory, and even very flattering to some of us of the craft, particularly as it brings us somewhat in juxtaposition with the pure members of the hierarchy. There are other persons, however, and among them soldiers of the army, faithfully laboring by day and by night as nurses in our hospitals, who cannot brook the idea of being placed beyond the pale of rightful consideration accorded to soldiers employed in making a bridge or cutting a road, and who cannot be brought to believe otherwise than that they might as well receive a portion if not their full measure of recompense on earth here below, and take their chance for higher and more permanent reward in another and a better world.

In due course of time the recommendations of the Surgeon General were enacted into law, and the corps was increased, hospital stewards were authorized, and extra duty pay was given to the men detailed in hospitals.

Each year there was a gain—always slow and sometimes imperceptible, but nevertheless a gain. The personnel of the medical department was so improved through the high standard demanded by the examining boards that the medical department of the army was quite on a plane with the best talent the country afforded. Each decade marked the departure of some giant of the corps, but the ranks were quickly closed, and the organization ever pressed forward.

At the outbreak of the War of Secession, the medical department was composed of one surgeon general with the rank of colonel, 30 surgeons with the rank of major, and 84 assistant surgeons of the rank of captain or first lieutenant. Very soon after the attack on Fort Sumter, and while troops were hurrying to the defense of the capital, the surgeon general, whose large experience and training would have rendered his services invaluable, was compelled to relinquish his office on account of failing health, which terminated in his death in May, 1861. The medical department of the army is under the greatest obligations to General Thomas Lawson. He had served for nearly 50 years. His vigorous intellect and industry were ever used in securing every right to his corps which the interests of the service demanded. He had an ardent love for the military profession and was indeed a typical medical officer. Surgeon Finley was appointed surgeon general May 15, 1861, and retired April 14, 1862.

The history of the medical corps at this critical period is most interesting and instructive, but time will not permit its consideration in detail. The magnitude of the struggle then being entered upon gradually but surely impressed itself upon the minds of the people. What at first seemed to be a question of but 75,000 men and 30 days, rapidly rose to millions of men and fifty times 30 days.

The medical corps of the permanent establishment was increased and reorganized. The logic of events was pointing out the place, function and responsibility of the medical department, and though all through that war, as in every other war, we had to contend strenuously for everything necessary

to our efficiency, yet as time rolled on these things were conceded, grudgingly indeed, but nevertheless conceded. One of the first things asked for, after we had provided a sufficient number of surgeons for the care of the actual sick and wounded, was the organization of a corps of medical inspectors whose duty, as the name of their office implies, was to look after and unify the work of the department. As early as 1862 the necessity for such a body of officers became pressing, and a bill was introduced by Mr. Wilson in February of that year, which finally became a law on the 16th April. Section 2 of this law provides that the medical inspector general shall have, under direction of the surgeon general, the supervision of all that relates to the sanitary condition of the army, whether in transports, quarters, or camp, and of the hygiene, police, discipline, and efficiency of field and general hospitals, under such regulations as may hereafter be established.

It seems remarkable that anybody could question the necessity for such inspection by a trained body of special inspectors, especially after the results obtained by them during our greatest war; but it is interesting to observe that in spite of this experience we passed through the Spanish-American war without such a corps, and every inspection that a chief surgeon made (and such were of necessity made every day), was in direct contravention of paragraph 1465, Army Regulations, 1895 (¶ 1671. A.R. 1901).

Assistant Surgeon Wm. A. Hammond was appointed Surgeon General April 25, 1862. General hospitals were at this time placed under the direction of the surgeon general, but this was done grudgingly. During this year the surgeon general, addressed a letter to the Secretary of War requesting that medical directors of the army be given the same rank as chiefs of the quartermaster's and subsistence departments, who, under the provisions of the Act of August 5, 1861, were made colonels, which was returned with the following endorsement: Refused unless it can be shown that the skill and efficiency of surgeons are increased by an increase of rank and pay.

Upon the receipt of this endorsement, the surgeon general addressed the following letter to the Secretary of War:

SIR:—I have the honor to acknowledge the receipt of a copy of your endorsement on my application to have the temporary rank of colonel given to the medical directors of General McClellan's and General Halleck's armies. In that endorsement it is stated: "Refused unless it can be shown that the skill and efficiency of the surgeons are increased by an increase of rank and pay."

I cannot undertake to show this. I do not believe it to be true, that the skill and efficiency of surgeons would be increased by an increase of rank and pay—but if not surgeons, certainly not quartermasters and commissaries, or engineer officers. I think however and I am sure, sir, you will agree with me, that no men work more for less reward than the officers of the medical department.

My request was not however intended to refer to surgeons as such, but to the medical directors of large armies. The duties of medical directors are purely administrative, they are on the staff of the commanding general, and have control of all the medical officers, supplies and details.

Their duties are most onerous. For the proper performance of important duties it is a recognized principle in military affairs, that rank is essential. A medical director has only the rank of any other surgeon, that of major, and I truly believe that increased rank will enable him to perform his duties better by causing his wishes to be treated with greater respect by his commanding officer, and his commands obeyed more willingly by his subordinates. The application was made without the knowledge of either of the officers who would be benefitted by the request being granted.

Upon presenting the matter to General McClellan he assured me that it met with his cordial approval and he authorized me to say so to you.

Other staff officers whose duties are of no greater importance than those of the officers for whom I ask increased rank, and which are not of so purely a military character, have had this rank conferred upon them. It certainly does not appear just that the chiefs of the Adjutant Generals', Quartermaster's and Subsistance departments should receive greatly increased rank and the chief of the Medical Department be entirely overlooked.

I again therefore ask that the medical directors of General McClellan's and General Halleck's armies may be ap-

pointed aides-de-camp with the rank of colonel, and I beg leave to add to this request that the same rank be given to the medical director of General Pope's army. I assure you that no act would be received with greater satisfaction by the 3,000 medical officers of our army than this.

No action was taken on this application, and it was not until February, 1865, that medical directors were granted additional rank, which was then given them by Act of Congress.

In his annual report for 1862, the Surgeon General recommended—

The establishment of a permanent hospital and ambulance corps, composed of men specially enlisted for duty in the medical department, and properly officered, who shall be required to perform the duties of nurses in the hospitals, and to attend to the service of the ambulances in the field. By the establishment of this corps, several thousand soldiers, now detached as nurses, cooks, etc., would be returned to duty with their regiments and the expense now incurred by the necessary employment of contract nurses obviated. * * * The necessity of such a corps has been recognized in all European armies, and I am able to speak from personal observation of the great advantages to be derived from it.

He also recommended the establishment of—

An army medical school in which medical cadets and others seeking admission into the corps could receive such instruction as would better fit them for commissions and which they cannot obtain in the ordinary medical schools, is a great desideratum. Such an institution could be established in connection with any general hospital, with but little if any expense to the United States. A hospital of a more permanent character than any now in this city, is I think necessary, and will be required for years after the present rebellion has ceased. I therefore recommend that suitable buildings be purchased or erected for that purpose. If this is done, the medical school and museum will be important accessions to it.

He called the attention of the authorities to the fact that the medical department should be charged with the duty of building its hospitals, that it should have control of its transportation, that a laboratory should be established for the examination and manufacture of medical supplies, and that a library should be established for the Surgeon General's office. Certain it is that almost everything that the corps has gotten

since his day was recommended by this remarkable man, who having incurred the enmity of Secretary Stanton was dismissed the service August 18th, 1864, in disgrace, and only after many years was restored to his position on the army list. He was succeeded by Medical Inspector Joseph K. Barnes (Surgeon U.S.A.)

Besides the medical officers of the regular and volunteer staff, and the medical officers of regiments, there was a class designated as Acting Assistant Surgeons, who were private physicians, uncommissioned, serving under contract to do duty with the forces in the field or in general hospitals. This class was very large, and embraced in its number some of the most eminent surgeons and physicians of the country. The medical cadets were generally young men, students of medicine, who were assigned to duty in general hospitals as dressers and assistants.

The Medical Department was still further increased by a number of hospital stewards, who were enlisted as needed and who performed the duties of druggists, clerks, and storekeepers.

During the years of the war the organization of the regular staff had been increased so as to number one Surgeon-General, one Assistant Surgeon-General, one Medical Inspector-General, sixteen medical inspectors, and 170 surgeons and assistant-surgeons; there had been appointed 547 surgeons and assistant-surgeons of volunteers; there were mustered into service between April, 1861, and the close of the war 210⁹ regimental surgeons and 3882 regimental assistant-surgeons. During the same period there were employed 85 acting staff surgeons and 5532 acting assistant-surgeons.

To the fidelity and efficiency of this vast body of professional men, Surgeon-General Barnes, in his annual report of 1865, bears the following well deserved tribute:

I desire to bear testimony to the ability, courage, and zeal manifested throughout the war by the officers of the Medical Department, under all circumstances and upon all occasions. With hardly an exception, they have been actuated by the highest motives of national and professional pride,

and the number who have been killed or wounded bears honorable testimony to their devotion and duty on the field of battle.

The following record of casualties of the regular and volunteer staff during the war shows well for the honor of those who are erroneously supposed to escape the dangers and chances of war.

Thirty-two were killed in battle, or by guerillas or partisans, and nine by accidents; eighty-three were wounded in action, of whom ten died; four died in rebel prisons, seven of yellow fever, three of cholera, and 271 of other diseases, most of which were incidental to camp life or the result of exposure in the field.

Of the amount of labor performed by the medical staff during the war, some idea may be obtained when it is stated that 5,825,480 cases of wounds and diseases occurred among the white troops and 629,354 cases among the colored troops.

The cost of maintaining the Medical Department formed no small portion of the total expenses of the war, and it is a matter of just pride that it can be said that the medical disbursing officers performed their duties faithfully and honestly, and that the immense quantities of medical supplies distributed all over the country were almost without exception properly accounted for. The expenditures on behalf of the Medical Department to the close of each fiscal year, on the 30th of June, from 1861 to 1866, were as follows:

1861.....	\$ 194,126	77
1862.....	2,371,113	19
1863.....	11,594,650	35
1864.....	11,025,791	33
1865.....	19,328,499	23
1866.....	2,837,801	37

Making a total of \$47,351,928.24, expended during the war (exclusive of salaries of commissioned officers) for the benefit of the sick and wounded soldiers of the nation.

With the close of the war, so rich in dearly bought experience, the Medical Department, apparently content to embalm that experience between the covers of its great history, returned to the methods of ante-bellum days, and the Army

again became the advance guard of civilization upon our western frontier.

The history of the Medical Department since 1865 may be outlined as follows:

On July 28, 1866, the following Act of Congress became law:

The Medical Department of the Army shall consist of one surgeon-general, with the rank of brigadier-general; one assistant surgeon-general, with the rank of colonel of cavalry; one chief medical purveyor, and four assistant medical purveyors, with the rank of lieutenant-colonel of cavalry; sixty surgeons, with the rank of major of cavalry; one hundred and fifty assistant-surgeons, with the rank of lieutenant of cavalry for the first three years of service, and the rank of captain of cavalry after three years' service.

On March 3d, 1869, all promotion or appointment in the Medical Department (and other staff corps) was suspended, and thereafter till 1874 the Department simply marked time. Never since its reorganization had all its offices been filled; and in 1874, when examinations for appointment were reinstated, there were nearly sixty vacancies.

By act of Congress approved June 23d, 1874, the Medical Department of the Army thereafter consisted of one surgeon-general with the rank, pay and emoluments of a brigadier-general; one assistant surgeon-general and one chief medical purveyor, each with the rank, pay and emoluments of a colonel; and two assistant medical purveyors with the rank, pay and emoluments of lieutenant-colonels; fifty surgeons, with the rank, pay and emoluments of majors; one hundred and fifty assistant-surgeons, with the rank, pay and emoluments of lieutenants of cavalry for the first five years' service, and with the rank, pay and emoluments of captains of cavalry after five years' service. And all original vacancies in the grade of assistant surgeons were to be filled by selection by competitive examination; and the Secretary of War was authorized to appoint, from the enlisted men of the Army, or cause to be enlisted, as many hospital stewards as the service might require, to be permanently attached to the Medical Department, under such regulations as he might prescribe.

The permanent attachment of hospital stewards to the Medical Department, reiterated in this law, was the germ of an organization, the Hospital Corps, which thereafter sprang into existence, and which is destined to radically change the methods that have for so many years obtained in our service—methods which were only temporarily changed to meet the exigencies of the most stupendous war the world has seen.

The Act of June 26th, 1876, declared that the number of assistant surgeons allowed by law should be reduced to one hundred and twenty-five; in addition to the grades then allowed by law, there should be four surgeons with the rank, pay and emoluments of colonels, and eight surgeons with the rank, pay and emoluments of lieutenant colonels, to be promoted by seniority from the medical officers of the Army.

July 3d. 1882, Col. Charles H. Crane was appointed Surgeon General; he was succeeded, November 23d, 1883, by Col. Robert Murray, who in turn was, on November 18th, 1886, succeeded by Lieut. Col. John Moore.

No further legislation affecting the Medical Department became law until March 1st, 1887, when the Act was passed organizing the Hospital Corps.

Loosely drawn and elastic as is this law, no Act of Congress since that of 1848—which for the first time recognized the military status of the medical officer—is more important to the present efficiency and future usefulness of the Medical Department. All the regulations governing this organization are of necessity based upon this law, and very well meet the current requirements of the various detachments scattered throughout the country; but such active-service experience as has been gained therewith has shown that a more closely knit military organization is necessary. This is directly in line with the experience of military medical officers in other armies, and there can be no question that a very much more detailed organization than now exists in the hospital corps will be necessary when we again find ourselves, as we surely will, in the midst of a war. Let us hope that we will not again have to organize under fire.

— Col. J. H. Baxter was appointed Surgeon General August 16, 1890, and was succeeded by Col. Charles Sutherland, January 7, 1891.

The following Act of Congress was approved July 27th, 1892:

That, from and after the passage of this Act, the grade of certain medical officers of the Army below that of surgeon-general shall be as follows: Those holding the rank of colonel, assistant surgeon-generals; those holding the rank of lieutenant-colonel, deputy surgeon-generals.

That before receiving the rank of captain of cavalry, assistant-surgeons shall be examined under the provisions of an Act approved October 1, 1892.

That medical officers of the Army may be assigned by the Secretary of War to such duties as the interests of the service may demand.

That all acts or parts of Acts inconsistent with the provisions of that Act are hereby repealed.

The third section of this Act as previously stated would appear to abrogate Section 1169 of the Revised Statutes, viz: "Officers of the Medical Department of the Army shall not be entitled, by virtue of their rank, to command in the line of the Army or in other staff corps;" and places the Medical Department in the same category with that of the staff corps, as set forth in paragraph 16, Army Regulations, 1889.

Lieut. Col. George M. Sternberg was appointed Surgeon General, May 30th, 1893.

From the foregoing it will be observed that there existed in the Medical Department of the United States Army at the close of this period, no detailed scheme of organization for active service. The war scheme promulgated by the law of 1864, which ceased to actively exist with the surrender of the Confederate forces, was abrogated by the peace scheme of 1887, which provides that "all necessary hospital services in garrison, camp or field (including ambulance service), shall be performed by the members of the Hospital Corps." Contrasted with the almost perfect sanitary organization of other armies, our then unpreparedness in this direction points a moral we can ill afford to ignore.

THE SANITARY SERVICE OF THE ENGLISH ARMY*

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ANGEL ISLAND, CALIFORNIA.

CAPTAIN MEDICAL DEPARTMENT, U. S. ARMY; MAJOR AND SURGEON OF UNITED STATES VOLUNTEERS.

THE many-headed medical departments of Great Britain consist of the Army Medical Staff, the Royal Army Medical Corps, the Militia Medical Staff Corps, the Militia Reserve Trained in Medical Duties, the Volunteer Medical Staff Corps, the Army Nursing Service, and "The medical establishments of the army generally". Fortunately for purposes of description their duties are practically parallel, and consist of the preparation of statistical returns for presentation to parliament, the supplying of medical stores to the army, the preparation of estimates for them, the care of the sick, the command of military hospitals in peace and war, and the duty of advising in matters (relating to barracks, camps, garrisons, stations, hospitals, transports, diet, dress, drills, and duties), which may conduce to the preservation of health.

The orders relating to the sanitary service are explicit in their detail, are contained in no less than eight books, and while necessarily quite cumbersome still are admirable in that they outline in full the duties of each position to which a medical officer may be called.

ORGANIZATION.

PERSONNEL.—The entire service is now undergoing a reorganization, but there is little likelihood of radical structural changes being made, though it is to be hoped that this great staff department soon will be placed on an equality with others of importance. At present it is beneath every department, including the chaplains. Supervis-

*A special report made to the Surgeon General of the Army.
(399)

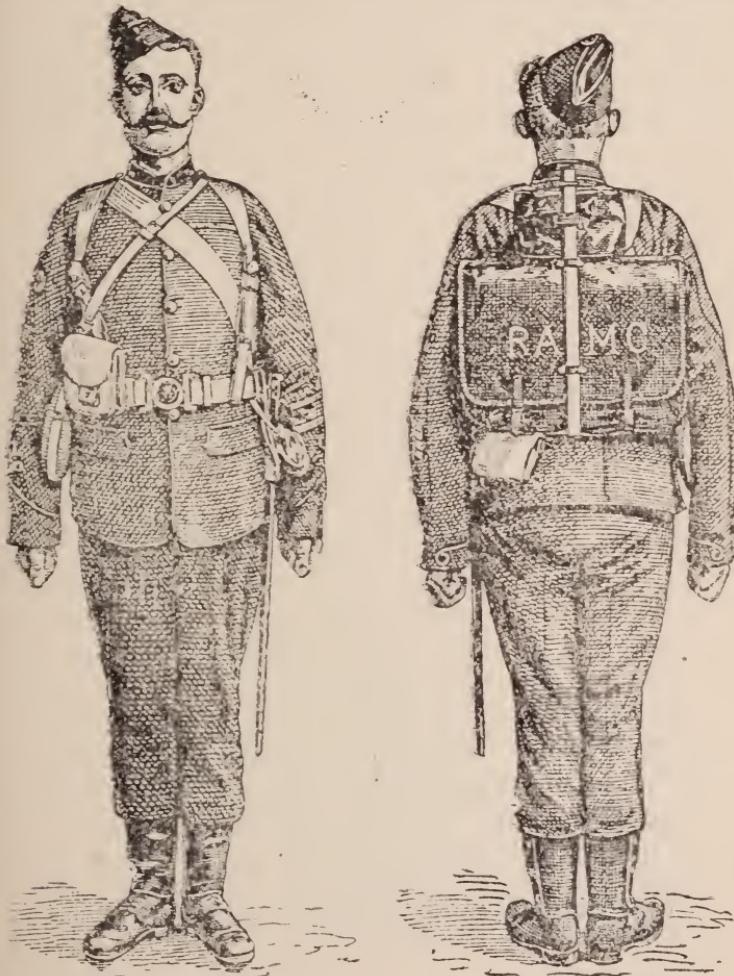
ing the whole is a Director General (major general) who is assisted in the work of his office by a Deputy Director, an Assistant Director, and two Deputy Assistant Directors bearing rank of Major General, Lieutenant Colonel, and Majors respectively. Exclusive of these there are (June, 1901):

1. Royal Army Medical Staff — 9 Surgeon Generals ranking as Major Generals.
 2. Royal Army Medical Corps — 27 Colonels.
 - 180 Lieutenant Colonels.
 - 314 Majors.
 - 214 Captains,
 - 230 Lieutenants,
 - 75 Quartermasters,
 - 5 Major Generals,
 - 16 Colonels,
 - 158 Lieutenant Colonels,
 - 154 Majors,
 - 240 Captains,
 - 131 Lieutenants.
 3. Indian Medical Service —
 4. Militia Medical Staff Corps —
 5. Volunteer Medical Staff Corps —
 6. Army Nursing Service —
- | | |
|----|------------------------------|
| 1 | Lieutenant Colonel, |
| 1 | Surgeon Major, |
| 8 | Surgeon Captains, |
| 8 | Surgeon Lieutenants, |
| 1 | Quartermaster. |
| 3 | Surgeon-Lieutenant-Colonels, |
| 4 | Surgeon-Majors, |
| 33 | Surgeon-Captains, |
| 25 | Surgeon-Lieutenants, |
| 2 | Adjutants, |
| 16 | Quartermasters, |
| 1 | Chaplain. |
| 1 | "Lady" Superintendent, |
| 19 | Superintendents, |
| 67 | "Sisters". |

Beneath these are the warrant officers (consisting of 86 Sergeant Majors), 1st and 2nd class Staff Sergeants, non-commissioned officers (Sergeants, Corporals, and Lance Corporals), and a variable number of first, second, and third class privates. All vacancies in the grade of quartermaster are filled by the promotion of warrant officers.

Apparently the standing of the female personnel is higher than with us, the nurses are allowed servants, and are on terms of social equality with the families of officers. Marriage with enlisted men is unknown, and the disturbing element of sex is less prominent than usual. There is a difference of opinion among medical officers as to their utility, those with

whom I conversed being about equally divided on the subject, but there is no division of opinion among the warrant and



(Front View.)

(Rear View.)

Fig. 1. Private of the Royal Army Medical Corps in Marching Order.

Belts are pipe-clayed in peace and rubbed with mud so as to resemble khaki in war
non-commissioned officers, who are unanimous in their con-
demnation of this feature of the military service, for reasons
not without reasonable foundation.

FIELD SERVICE.—In time of war there are in each separate army a Principal Medical Officer of the Force, who in addition to other specified duties "will under the General Officer Commanding, have supreme control of, and be responsible for, all medical arrangements and establishments,"* and a Principal Medical Officer on Lines of Communication who, under the Inspector General, has control of all hospital establishments on lines of communication and at the base (including hospital ships). The Chief Surgeon of a division is charged with more authority over matters relating to the health of troops than with us, and camps, sites, buildings, and villages must be inspected by him (or by one of his staff) before being occupied by troops.

To each staff or regimental unit a medical officer is attached to afford temporary assistance in camp, march, or action. Though under the orders of the commanding officer, he receives instructions from, and is under the control of the division surgeon. He is furnished a servant from the command, a lance corporal, and a private—the latter acting as orderly. Before an action two trained men report to him from each company, without their arms, and none of this personnel loses touch with their unit, or are allowed to carry back wounded.

INSTRUCTION OF OFFICERS.—The approved candidate for a commission enters the army medical school at Netley as a surgeon on probation, and after a course of from four to five months on the specialty of military medicine, is commissioned on passing a satisfactory examination. Medical officers, cadets, and officers of Royal Engineers, and line officers are also allowed to attend courses.

The school is an independent command under the Secretary for War, and is governed by its own senate, which consists of the Director General of the Army Medical Service, the Commanding Officer of the Royal Victoria Hospital at Netley, and the four professors. The subjects of the course are under the direction of the professors occupying the chairs of hygiene,

*Regulations Army Medical Services, 1900, Pg. 627.

clinical and military medicine, clinical and military surgery, and pathology.

The course on hygiene is both practical and theoretical, is admirable in its thorough comprehensiveness, and includes a broad general view of the subject, its history, its civil and military objects, and the geographical distribution of disease.



Fig. 2. Sergeant Major Royal Army Medical Corps.

Care is taken to impress on the student that the highest function of the military surgeon is the prevention of disease. Space does not permit of a complete outline of the course, the principal theoretical divisions of which are soil, water, sewerage, air, habitations, food, exercise, clothing, equipment, disinfectants, disposal of the dead, military service, (at home and

abroad) climate, and comparisons between civil and military statistics.

The practical instruction includes various analyses of water, air and food.

In clinical and military medicine there is bedside instruction on the more prevalent diseases of military men, together with lectures on the diseases which are modified by the habits, character and duties of the soldier, invaliding and tropical diseases. Emphasis is laid on the physical geography



Fig. 3. Royal Army Medical Corps Officers' Mess at Netley.

and climate of the various colonies, as well as on such diseases to which the British recruit is peculiarly prone. But little attention seemed to be paid to venereal disease notwithstanding the extreme prevalence of such affections in the English service. Lunacy is considered of sufficient importance to have six lectures devoted to it.

The course on military surgery consists of sixteen lectures and demonstrations covering the mechanics of projectiles, gunshot wounds, wind contusions, first aid, bearer com-

panies, military hospitals, and property depots. The assistant professor on this subject also gives practical demonstrations on eye surgery, refraction, and the X-ray apparatus.

Practical laboratory work in pathology is carried on throughout the course and the sixteen lectures deal princi-



Fig. 4. Officer Royal Army Medical Corps (fatigue uniform).*

pally with the pathological conditions which are common among soldiers.

Such candidates as pass satisfactorily are commissioned and sent to Aldershot for their technical military training. The instruction is largely practical in connection with the training of the recruit battalion of the Royal Army Medical

*Lt. Col. Charlton, R.A.M.C., commanding at Netley.

Corps and includes the drill, interior economy and discipline of the medical service. The drills are: foot and mounted, railway, wagon, saddle and cacolet, ambulance, setting up, and litter. Officers are at first drilled separately in awkward squads, and in these carry walking sticks instead of swords. Mounted officers wear spurs with all uniforms.

Features of the education of the young officer are various "messes" (corresponding to our clubs), which every officer



Fig. 5. West Wing of Royal Victoria Hospital, at Netley taken from the central point.

is required to join. The special mess uniform which is required resembles as a rule that of a drum major, and each mess has traditions and customs peculiar to it. In some regimental messes (King's Royal Rifles, 60th, for example), no insignia of rank is worn, but nevertheless the mess dinner is a military function, and the mess itself a military organization where proper respect for superiors is required. The *esprit de corps* is shown by the many remembrances sent back by officers serving in distant colonies, and the social strength which the

medical department has shown during the recent reorganization is largely due to this factor.

INSTRUCTION OF ENLISTED MEN.—The English recruits seem to me to compare unfavorably with our own, and also to those of Canada, Australia, Ceylon, and Tasmania. This is largely due to poor pay, that of a private being about twenty-eight cents a day, with stoppages of seven cents for mess, two cents for laundry, and fourteen cents when sick in hospital. This places the man in a condition of abject pov-



Fig. 6. Closed Hospital Marquee (smaller than regulation pattern.)

erty. The undersized, underfed, and undeveloped boys one sees in the English ranks, or invalidated from South Africa, are not at all representative of the sturdy English race. Our own recruits, even among our volunteers, are mentally as well as physically superior to them, and our instruction very properly begins at a more advanced point.

The military training commences with squad and company drill, including the principles of working in extended order, a modified course of musketry instruction, and sword

and carbine-sword-bayonet exercises. As is usual in other European services the sanitary soldiers carry proper side arms. The recruit then progresses to litter drill, hand-seat drill, use of country carts, general service wagons, railway cars (Zavodovski's method), pack saddles and cacolets. The field training proper consists of bearer company practice, field hospital encampments, tent pitching, ceremonies, and semaphore signalling.

The technical teaching occupies about ten weeks, and



Fig. 7. Hospital Marquee. One side Open.

covers practically the same ground as does that of our own service. The principal training school is at Aldershot, where there is a battalion of the Royal Army Medical Corps consisting of a commanding officer, a second in command, an adjutant, a quartermaster, and four companies. The daily routine is

6.30—7.30 Drill,
9.00—10.00 Lecture,
10.00—11.00 Drill,
11.00—12.00 Examination,
2.00—3.00 Demonstration in First Aid.

The lectures cover elementary anatomy, physiology, fractures and dislocations, wounds and dressings, antisepsis, first aid, emergencies, hemorrhage, medicines, baths, instruments, poisons, ward management, and observation of symptoms. There is also didactic instruction on such subjects as tent pitching, field kitchens, latrines, camping, and the work of field hospitals.

The squads at Aldershot were sharp and smart in their drill, and although their litter was heavy and of a poor design, they handled it very well. The men wore knee-caps to protect their clothing, their issue shoe is shod with iron, and the wearing of side arms improves the appearance of the detachment. Both officers and men compare advantageously with those of other branches of their service, and the many advantages of a central school are self-evident.

SUPPLIES AND EQUIPMENT.

TENTAGE.—According to the Field Service Manual, tents (with the exception of those used for operating) are not considered necessary under normal conditions. The *circular forms* are made of medium duck with six inch eaves, and three bib ventilators. The more common form is 13 feet in diameter, has 26 inch walls, is $9\frac{3}{4}$ feet high, and weighs without its poles and pins $41\frac{1}{2}$ lbs. This tent accommodates fifteen (!) soldiers, or four patients. Another popular form has a diameter six inches greater and weighs three pounds more.

The "Hospital Marquee" (Figs. 6 and 7), resembles the marquee in use during the civil war, is an excellent tent and in my opinion is superior to any in our service. It covers an ellipse 50 x 31 feet, has double roofs and walls, and a waterproof carpet. It is a strong and serviceable tent which when rolled in its canvas cover with pegs, poles, mauls, and ropes weighs 512 pounds. It will accommodate about 40 patients or 90 men (using our allowance of 35 square feet.) Their "operating tent" resembles our hospital tent except that it is 20 x 14 x $9\frac{1}{3}$ feet, with walls but three feet high. It compares unfavorably with either the Munson or the old pattern hospital tent.

The "Tortoise Field Hospital" (Fig. 8), is an ambulance

wagon with a large elliptical tent packed upon it so as to leave the interior of the vehicle available for a stove, stores, and two open litters. To pitch it it is only necessary to unroll the tent from the sides of the wagon, the top of which then becomes its central support. The tent thus formed is large, comfortable and serviceable, having a capacity of twelve beds. The stove not only heats the tent but can cook for the sick as well while en route, and the wagon can be withdrawn from the tent after it is once pitched, if needed for other purposes.



Fig. 8. Tortoise Field Hospital.

These tents are in use in several foreign services, and it is recommended that one be procured for experimental purposes.

The instruments, furniture (which is not the property of the medical department), and medical supplies are not superior to those in our own service either in their quality or their arrangements for transportation. The blank forms in use are cumbersome and antiquated, the card system is unknown except in a rudimentary form and clerical work is not conducted according to modern methods.

The principal hospitals visited were Paddington at Sydney, Australia, (64 beds), Adelaide Hospital, a civil institution but receiving soldiers and sailors (320), Columbo Station Hospital (60) Ceylon, Cambridge Hospital (720) at Aldershot, and the Royal Victoria at Netley (2800). Of these the army hospitals proper were clean and well administered, the personnel was well disciplined and soldierly in appearance, and the buildings though old were well adapted to their purpose. The number of officers allowed is greater than with us and they



Fig. 8. An English Army Canteen.

are of higher rank. For instance the Columbo Station Hospital of 60 beds had a lieutenant colonel, a major and two captains assigned to it but on the afternoon of my visit, although it was fairly well filled, there was no officer there and a very intelligent warrant officer had been left in command.

The professional service is well performed, and there is a systematic and business-like way of providing every possible care and comfort for the sick soldier. Nearly all the larger hospitals have their standing orders printed and the duties of each man are outlined in detail. Much friction always exists

between warrant and non-commissioned officers and the female nurses, and in my opinion the latter are a detriment to their service, the possible exception being in the large base hospitals.

On entering an English institution the patient gives up all clothing, and receives a hospital suit which he wears until he leaves. If he be a non-commissioned officer, proper chevrons are issued to him at the same time. At a non-dieted



Fig. 9. Huts of the German pattern used at Netley.

hospital his rations are furnished by his organization, but in most hospitals our own system prevails. There is a lack of modern plumbing, and the usual systems of heating and lighting are not what one would expect in so progressive a country. On the other hand the buildings are kept in excellent repair, and Callev's system of painting gives a durable, clean and economical finish. Most of the wards are painted a duck-egg green, seven thin coats being applied.

Whenever a hospital becomes crowded beyond its capacity

it may expand into huts of the German pattern, and at Netley as many as a hundred of these have been filled (Fig. 9). These larger hospitals are very complete and autonomous. Netley having its own railroad connecting it with the Southampton docks, and the general system of the country. The train consists of five coaches having a capacity of seventy recumbent patients, and the carriages are lightly and strongly made. The whole is a model of comfort and convenience, and is in charge of a corporal and five privates. A special detraining squad under a sergeant is detailed when necessary, and the home station is so arranged that patients can be admitted directly into the hospital. The Royal Victoria also has its own conservatory, swimming baths, fire department, museum and chapel. Officers as well as men are forced to attend churches.

The size of this institution can be better understood when it is remarked that over a thousand patients have passed through in a week, and that the main corridor is six hundred yards long.

TRANSPORTATION.—Three forms of ambulance wagons are used. The first is a four-wheeled covered vehicle, weighing empty 1773 pounds, and is designed for two large animals. It accommodates six wounded (two recumbent, and four sitting at their heads and feet) and the litters are provided with pillows. Special features are the forage locker (three bushels) under the floor, a nine-and-a-half gallon water tank, loops for rifles, and lockers for wine and sundries. It carries four litters.

The second form has larger front wheels (45 in.), the whiffletree has springs to overcome the jar of starting, and the weight is 1839 pounds. This wagon is able to turn in a thirty-one foot circle. The other ambulance has but two wheels (56 in.), and weighs but 919 pounds. It carries two recumbent or four sitting patients, has platform springs below the axle, spiral springs at the whiffletree, and a canvas cover. The water tank has a hose and "mouthpiece" attached, there is a medicine locker, two slings for rifles, and red and white side

lights. The cart is strong, well built, is said to be comfortable, and can follow troops almost anywhere. It is believed that a few of these carts could be used advantageously in places where our own ambulance could not follow.

Another cart, on which is mounted a strong iron water



Fig. 10. Water Cart.

tank (Fig. 10), carries 108 gallons and weighs loaded 1890 pounds.

Neither of the four-wheeled ambulances compares favorably with our own, and the baggage wagons are heavy (2112 lbs.) and roughly finished. There is however an excellent twenty-five horse power steam wagon which, although but

slightly larger than the army wagon, carries a load of five tons, and draws an equal amount at the same time. It is made by the Thornycroft Company, has a speed of five miles an hour, and uses five pounds of fuel per mile. It is apparently an efficient and reliable means of transportation.

FIELD SERVICE.

Without preparation for self-sustaining service in campaign a medical department is useless for war. It must be able not only to take care of itself, but also to furn-



Fig. 11. Regimental Maltese Cart.

ish the knowledge of soil, water, and habitation without which an army inevitably becomes diseased. The English seem to realize this and divide their department into field service units comprising regimental detachments, bearer companies, field hospitals, hospital trains, hospital ships, staff units, and supply depots. The regimental detachment consists of a medical officer with assistants, a lance corporal, a private as driver of the regimental cart, (Fig. 11), a servant,

and the two bearers from each company. The equipment consists of a medical companion, water bottle, and field medical panniers. The company bearers leave their arms on the cart when an action is expected, all enlisted men in this detachment being taken from the regiment. The defects of such a system are obvious.

The bearer companies are composed of details from the Royal Army Medical Corps and the Army Service Corps, and consist of 1 major, 1 captain, 1 lieutenant, 2 warrant officers,



Fig. 12. Chair used for carrying patients on stairs.

7 sergeants, 8 corporals, 1 bugler, 31 drivers, 44 privates, 56 horses, 4 carts, 1 water cart, and 10 ambulance wagons. Of the carts, the first carries four litters, operating tent, operating table, surgical dressings, and instruments. The weight of this cart and its load is two tons. The second supply cart has cooking utensils, sundry repair materials, lamps and oil, tools, flags, four litters, charcoal filter, and linen. It weighs when loaded 1825 pounds. The third cart

is for baggage, the commanding officer being allowed fifty pounds, the other two officers seventy, and non-commissioned officers ten each. It also carries blankets, horse blankets, 158 pounds of soap, rations, shoes and shoemakers' tools, 94 pounds of horse shoes, and weighs loaded 1800 pounds. The other cart carries food supplies, camp cooking utensils, and forage and weighs 2220 pounds.

The field hospitals are of one hundred beds each, and are supposed to be divisible. Their personnel and equipment are as follows: 1 lieutenant colonel, 1 major, 1 captain, 1 lieutenant, 1 quartermaster, 2 warrant officers, 8 sergeants, 6 corporals, 17 drivers, 23 privates, 28 horses, and 6 vehicles. Of the latter one carries medical and surgical supplies, stationery, filters, cooking utensils, tools, 4 litters, camp and operating table, operating tent, extra wheel, and forage. The weight is $2\frac{1}{2}$ tons. In another wagon are much the same stores, while each of the two baggage wagons carries officers' and non-commissioned officers' luggage, bed linen and blankets, flags, tools, camp stove and so forth. These wagons weigh when loaded about two tons each, but the wagons themselves are so heavy that they apparently do not carry their own weight in load. Each field hospital has also the supply and water carts above described. On the march they follow the bearer companies. In my opinion the field hospital is too small and is over officered.

The hospital trains are composed either of cars regularly fitted for this purpose, or ordinary passenger coaches, or freight cars adapted to this use according to the method of

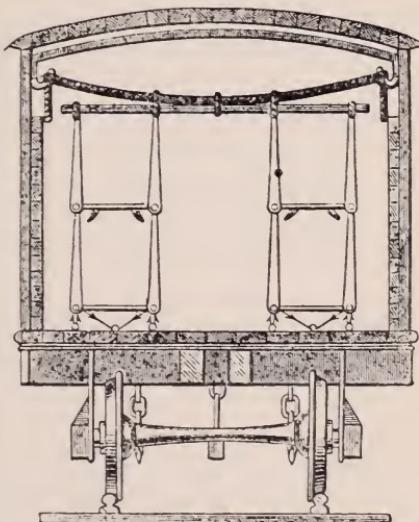


Fig. 13. Zavodovski's method of improvising hospital cars.

Zavodovski. (Fig. 13.) The regulation train carries 132 recumbent sick, including 4 officers, and is manned by 1 field officer, 2 company officers, 2 sergeants, 4 corporals, and 20 privates all of the Royal Army Medical Corps. Their duties are commanding officer, care of the sick and wounded (these two officers being replaceable by civilian surgeons), ward master, pharmacist, 2 assistant ward masters, property man, 3 cooks, 16 ward nurses, and 2 on general police.



Fig. 14. Field Hospital at Melbourne, Victoria, Australia.

The supply depots are those of the base and those of the lines of communication. Cases containing medical supplies and the material used for their transportation are marked with the red cross and under the regulations cannot be diverted from the medical service without the *direct* order of the commanding general, and then only in cases of special emergency, when the Geneva cross must be removed. The allowance of personnel for the base depots is 1 officer, 2 non-commissioned officers, and 6 privates. A horse is also allowed.

Manifestly these depots are dependant on civilian labor, carpenters being provided when they are available. The ones on the lines of communication nearer the front are allowed but three privates.

The hospital ships theoretically carry 200 sick each, including 20 officers, and are not under the command of the medical department. Those in charge of the sick and the police of a ship are 3 field officers, 2 company officers (who may be replaced by contract surgeons), quartermaster, warrant officer, 5 sergeants, 5 corporals, and 29 privates. In addition there may be specially detailed 6 stewards, 1 stewardess, dhobies, lascars, and punkah men as are required for, and 4 nursing "sisters".

COLONIAL SERVICE.

Of the colonies, New South Wales possesses a "partially paid" medical department fully up to the standard of that of the home country, and organized on the same lines. The officers are men of more than ordinary aptitude, unhampered by obsolete methods. Possessing an active and strenuous personnel, and a liberally disposed government, the development of the medical service of the forces of the new Federation should prove of great interest. The Indian Service is so closely allied to that of England (so far as its organization is concerned) that there is much similarity between them, while the Canadian militia has about the same system as our own.

REMARKS.

South Africa has taught England what it is hoped we have learned during our late war, namely the value of an organized medical department possessing real authority in relation to all subjects affecting the health of troops. An aggregation of regimental medical services is not a medical department, and uniformity of material and administrative methods is of no greater importance, than is uniformity in the education of the personnel which is to handle them. The English are alive to the vital importance of the necessity for specialized training for their sanitary soldiers (commissioned as well as enlisted) and several officers expressed regret at a

defect in their system, which seems to exist in our own as well, due to the lack of inducements for reenlistment.

Four months of technical training costs 11 per cent of an enlistment. The pay of our hospital corps private for four months is \$111.00* and this time is not only gained by a reenlistment, but the man's added experience lends ever greater value to his services. It would seem that a substantial addition to our present reenlistment pay might be made.

The "better type of medical officer"† is conspicuous in the British service and there is every prospect that the rapid improvement which they recently have made will be continued. The Royal Army Medical Corps is now on a strong military footing, its discipline is good, and it is attracting a better class of men than ever before, while the warrant and non-commissioned officers are zealous and ambitious. The designation of our non-commissioned officers as stewards and acting stewards seems to rather justly furnish some ground for amusement, and their lack of side arms was a constant subject of remark.

In closing this report I desire to express my gratitude for the official and personal courtesy with which I was everywhere received.



*\$18 per month pay proper, clothing 12½ cents per day, ration 20 cents.

†Woodhull.

NOTE—Similar reports by Captain Kulp on the German and French Services are embodied in the report of the Surgeon General for 1901.

EMERGENCY HERNIOTOMY AND ENTERECTOMY,
WITH SECONDARY ENTEROSTOMY AND OC-
CLUSION OF A PORTION OF THE ILIUM.*

BY JOHN M. HEWITT, M. D.,

FORT GIBBON, ALASKA.

CONTRACT SURGEON IN THE UNITED STATES ARMY.

A CIVILIAN employee of the army, James K. Galbreath, aged 45, a native of the United States, with previous good health,—although he had undergone the hardships incidental to prospecting in Alaska for twenty-five years,—had been affected with a small right femoral hernia for about a year during the last two months of which it seems to have been irreducible, but it gave him no annoyance.

This man accompanied a detachment which started from Fort Gibbon over the ice, on March 31st, 1901, for a point about one hundred miles below for the construction of the government telegraph line. He pushed a heavily loaded sled during this trip, which lasted sixteen days and was a hard one owing to stormy weather and a heavy trail. This was followed by another trip of fifteen miles, upon his return from which on the evening of April 28th, he complained of cramps. The usual medicines were prescribed and as he was reported to be no better upon the following morning, an examination was made and a right femoral hernia, about the size of a hen's egg, was discovered. The symptoms were moderately severe paroxysms of abdominal pain, slight vomiting and constipation. The pulse and temperature were normal.

Careful tassis, and the application of collodion, and a high enema with a colon tube, were tried, without result. Tassis, under complete chloroform anesthesia, failed also, and his condition being fully explained to him an operation was

*Special report to the Surgeon General of the Army.
(421)

urged, but he refused it. The character of his pains increased in severity and frequency until the fifth day when he was vomiting freely, although the ejecta were not fecal.

There had been no bowel movement, nor passage of flatus, the abdomen was only moderately distended, his pulse and temperature remained practically normal, and altogether his general condition did not appear alarming. Operation had been constantly urged from the second day and was only accepted by the patient, after much persuasion, upon the fifth day. A room in the Signal Station at Kockrine, Alaska, the camp then occupied by the detachment, was hastily prepared for the operation. The chloroform was administered by a Private of the Hospital Corps and the assistants were a Sergeant and two Privates. The following account is copied from my May report of this case.

"Under chloroform anesthesia, an incision was made and the tumor exposed. Upon opening the sac, about 15 c. c. of dark brown fluid escaped. The hernial constituents were, about three inches of small intestine, probably ileum, and some omentum, the intestine being very black in color and evidently gangrenous. The constricting ring was incised with considerable difficulty, as the sac was everywhere adherent, especially at the neck, where twisting of the hernial body on its axis, had matted the structures together. The intestine was freed and the sac had to be removed piecemeal, down to the neck, where, owing to the anatomical difficulties existant in femoral hernia in this situation, the presence of firm adhesions, the occurrence of troublesome hemorrhage and the lack of skilled assistance, it was found impossible to free it from the surrounding tissues. Not having a Murphy button, a primary resection was deemed inadvisable, so, the intestinal loop was brought up into the wound, stitched there, and treated with hot aseptic gauze pads. The gut reacted fairly well, but it was found necessary to resect about one inch of it, together with a small piece of omentum, four days afterwards; thus establishing an artificial anus. Recovery has been rapid and uneventful, the highest temperature having

been 100° F. on the second day after the operation. An anastomosis with the Murphy button, will be attempted later."

There is hardly any question that an operation performed as early as the third day, would have disclosed gangrene necessitating resection, but the patient positively refused consent until the fifth day and then only yielded to pressure amounting almost to force.

Upon the opening of navigation the patient was transferred to the Post Hospital at Fort Gibbon, Alaska, and upon July 27th with the assistance of Captain S. T. Weirick, Assistant Surgeon U.S.V., I performed an end-to-end anastomosis with a Murphy button, occluding a portion of the ileum.

Under chloroform anesthesia, ether being substituted afterwards, the usual curvilinear incision for exposure of the cecum and appendix, was made above Poupart's ligament. The vermiform appendix was at once encountered but, being innocent, was not molested. As anticipated, the incarcerated ileum, above the ileo-cecal valve, was found solidly welded together with omentum and portions of the sac which it had been found impossible to remove at the first operation; so that, to have dissected free the resected ends and to bring them within the abdominal cavity for anastomosis, would have been an extremely difficult thing to do, not to mention the danger of the introduction of infection from the artificial anus, which although carefully prepared and ligated, was still probably septic.

The expedient of making another resection within the abdominal cavity close up to the crural opening, and bringing the freshly resected ends together, thereby occluding the amputated, or original hernial portion of the ileum with its mesentery attached, and leaving it permanently imprisoned within the crural canal forming in time a fibrous plug and effecting a radical cure of the hernia, suggested itself. A pair of McLaren clamps and two others made of gauze having been applied, the resection was made, the incisions being carried well down into the mesentery for greater freedom in affecting the anastomosis. The resected ends of the occluded bowel

stumps were cleansed of fecal matter and fresh hydrogen peroxide 10 v. was applied and the serous surfaces being turned inward, they were closed completely with silk sutures. The ends designed for the anastomosis were then brought out of the abdominal wound, and it was found that considerable narrowing of the distal end and some thickening of its mucosa had taken place, so that the ordinary small intestine Murphy button could not be inserted, consequently, the No. 2 button, commonly used in cholecystenterostomy, was employed.

The silk used for puckering strings broke repeatedly, necessitating much delay in sterilizing more and in freshening up the bowel ends. There was considerable ectropion of the mucous coat of the distal end, which prevented snug coaptation of the shoulders of the button, and even after clipping this away, a few auxiliary sero-serous sutures of chromatised gut had to be inserted.

The anastomosis having been made, the bowel was replaced within the abdominal cavity, and the free incisions which had been carried down into the mesentery were not closed sufficiently to cause a too close coaptation of the stumps to the anastomosis. The abdominal cavity was then flushed out with hot normal saline solution, about a quart being left in, and the incision was closed with two rows of silk sutures, one for the peritoneum and one for the rest, a small wick drain being inserted, as infection was feared. Owing to having to send at a distance for the Murphy button and to a series of accidents, necessitating fresh sterilization, which was done at a distance, the patient was on the table about five hours. However, he reacted quickly, suffered little shock, and sustained no post-operative intestinal paresis, a fact remarkable for the length of time the abdominal cavity remained open and the amount of handling to which the bowels were subjected. He recovered without incident, having two fecal movements on the second day and one on the third day. The wick drain was removed on the fifth day and a small stitch abscess gave little trouble. The highest temperature was 100 4-5° F.

I returned to my detachment on the tenth day after the operation and Dr. Weirick in whose care he remained, informed me that the patient passed the button on the morning of the eighteenth day after which date he steadily improved. The bowel ends at the sight of the artificial anus were to be dissected out for a short distance below the skin in order to allow the fistulous opening to close with a few sutures.

I am not aware that this procedure, of occluding and leaving the bowel stumps in the hernial canal permanently, is frequently resorted to, or if it is done at all. The reference at hand is meager, but I find that Helferich, of Greifswald, a few years ago, recommended in operations for strangulated hernia, when gangrene was found, that, the abdominal cavity be opened immediately and a resection and an anastomosis be made inside, the occluded gut to be dissected out of the hernial canal however, subsequently.

A theoretical objection to the expedient of leaving the stumps in permanently, would seem to be the possible production after convalescence, of an angularity and consequent obstruction of the restored bowel, anchored, as it is, by means of the mesentery, to the occluded portion.

Fort Gibbon, Alaska, Sept. 17. 1901.



MULTIPLE SHOT WOUNDS OF THE HAND AND FOREARM.

By F. W. F. WIEBER, M. D.

ANNAPOLIS, MARYLAND.

SURGEON (LIEUTENANT) IN THE UNITED STATES NAVY.

A BOUT 10 years ago, Mr. S., while on a hunting trip with a companion, was shot, by the accidental discharge of both barrels of a shot-gun, loaded with No. 8 bird shot, in the hands of his companion, from a distance of about 6 feet. The contents of one barrel passed into the upper and outer portion of the left thigh about on a level with and a little to the inner side of the greater trochanter and passed out on a level and slightly behind it. The other barrel was discharged into the back of the left hand. The shots were scattered into the tissues from the metacarpus to near the elbow. Many shots can be felt without any trouble, under the skin, by the examining finger. The wounds caused by this accident were healed and the patient was able to attend to his business about three months after the accident.

With the exception of some weakness of muscles and in the absence of sensory symptoms, excepting occasional twinges and pains at changes in the weather, the man is not inconvenienced by the presence of these foreign bodies in his hand and forearm. Since the healing took place, several of the shots have come so near the surface, that they were easily removed by small incisions.

The skiagraph was taken at the physical laboratory of the Naval Academy by Professor Terry, by whose permission this copy is used.

The case is presented rather as a curiosity, than as one involving much practical significance from a surgeon's standpoint.



Skiagraph in case of Multiple Shot Wounds of Hand and Forearm.

THE MILITIA MEDICAL OFFICER AND HIS PAPERS*

By MAJOR CHARLES C. FOSTER,

CAMBRIDGE, MASS.,

SURGEON OF THE FIFTH REGIMENT INFANTRY, M.V.M.

THE first thought of the volunteer medical officer is apt to be, why should he be bothered with all these papers? He thinks them an unmitigated nuisance, and is sure that nine-tenths of them are wholly unnecessary, or worse, for they take up time that might better be spent on his work. In his own practice he needs but little paper work, and fails to see why so much should be required of him now. The difference can be told in one word,—responsibility.

His own practice is his own affair. When he has done his duty by his patient, other details, such as collecting his bill, concern him alone. His medicines, dressings, instruments, and other equipment are his own property, to be procured, used, wasted or lost, as he sees fit. He can undertake or decline any case that comes to him, and is responsible only to his own conscience and the law.

When he enters the service, all this is changed. He becomes simply an agent of the government, given certain powers, held strictly accountable for every action and for every article of property put into his care, and required to keep the heads of his department constantly informed as to all medical events in the command to which he is attached. To fulfill these duties, a regular system of reports is necessary; and, for the sake of uniformity, accuracy and labor saving, a special blank form has been devised for each ordinary occasion, these constituting our papers.

Now, what particular system of papers shall we use? Obviously the same that we shall have to use in active service,

*Read before the Massachusetts Volunteer Militia School for Medical Officers, Boston, Mass., Dec. 18, 1900.

—that of the Regular Army. This contains practically all the forms that we need in our militia work, besides a number with which we need not concern ourselves at present. Let us consider the use of a few of the most important ones.

The first duty of a newly assigned medical officer is to provide himself with the necessary materials of all sorts. He procures these by making out a "requisition", which is simply a statement of what he wants, on the regular form provided. He makes this in duplicate, keeps one copy for his own records, and forwards the other through regular channels; that is to say, he sends it to his next senior adjutant. What becomes of it afterwards is the latter's business.

By and by the supplies arrive, perhaps all he has asked for, perhaps only such articles as his seniors think fitting, and with them comes an "invoice" in duplicate,—a list of the articles, signed by the officer issuing them. He verifies this list, makes sure that everything is there, then files it among his records, and makes out a "receipt" for them, in duplicate, keeping one copy and forwarding the other to the officer from whom the supplies came.

The property is now in his hands; he is charged with it, and held responsible for it; and his next duty is to put down each item in his "property book" stating how each item came into his possession, whether issued by so and so, turned over by so and so, purchased or found. In the U. S. army a distinction is drawn between "expendable" articles, chiefly drugs and dressings, and articles of permanent usefulness. At the supply depot one class is charged in an officer's account in red ink, and the other in black. He is not required to put down expendable articles in his property book, simply signing a receipt as a voucher for the officer issuing them. At every permanent post hospital an annual statement of the amounts of various articles on hand is required.

The next question is, "How does all this property pass out of the officer's hands, and how is he released from further responsibility for it?" As I have said, some articles may be expended, that is, used up, in the daily work; others may be

lost or broken; others may be condemned by an inspector and ordered to be sold. Forms are provided for separating all such occurrences. But the commonest way of disposing of property is by "turning over" to some other officer. In this case blanks are filled out in duplicate of articles turned over by A to B, by order of C (A had also better keep a copy for his files), and sent to B with the articles. B returns a receipt for the same, in duplicate, and keeps a copy himself. He then notes the articles in his property book as turned over by A on such a date.

Every six months he must make a report of property in his possession. He begins with his account as it stood at the end of the last six months, puts down every article received or disposed of since then, giving in every case the manner of receipt or disposal, sums it up, and forwards a copy, keeping the original in the property book. With this he forwards copies of all invoices of articles received or turned over by him, and also of receipts from other officers for articles turned over to them.

In all cases where papers are made out in duplicate, one copy should be marked original and the other duplicate.

So much for property. The remaining papers pertain chiefly to strictly professional matters.

The first of these is the morning sick report, which is the summing-up of the several company reports. Our custom of holding sick call before breakfast, and making out the report at once, is very inconvenient, as it results in everything being done in a hurry, and obliges the officer who makes it out to breakfast alone after the rest of the mess have finished.

Every man who appears in the sick reports should also be put down in the register of patients, with diagnosis, dates of falling sick and of recovery, and final disposition of case.

Once a month there is copied from this book and forwarded a list of completed cases, through medical channels. Once a month a sanitary report is forwarded. Any epidemic outbreak calls for a special report. After every battle a special list of wounded must be sent. Every recruit examined must

be properly recorded; every patient transferred to another hospital must be so recorded on the books, and must be accompanied by a proper transfer slip. In Massachusetts any accident or serious occurrence must be at once reported, in duplicate, on the emergency report. Sometimes a record of the weather is ordered to be kept. If funds for any purpose are put in an officer's hands, he must account for them very carefully.

All this seems at first a tremendous mass of wearisome detail; but one gradually learns, first, that Uncle Sam insists that these things *shall* be done in just his way, and no other; and, second, that his way is apt to be the easiest in the end, and, indeed, the only way in which one can acquit himself of responsibility and be square with the authorities.

At a certain stage of his progress one is apt to get the idea that government cares little what he does with his patients, so long as he reports them nicely; but later he will change his mind, especially if the inspecting officer is wide awake.

Finally, let me advise every officer to keep in his files and letterpress or copy book either originals or copies of practically everything official that passes through his hands. Some day some one of them may prove of very great value to him.

In 1898 one great trouble of the volunteer medical officer was his inability to find out just what government wanted him to do, how it wanted him to do it, and what equipment it meant him to have. In my own case, no inspector came near me, and I received not a word of instructions for over three months. If General Blood had not helped me, the regiment and I might have fared badly. It seems to me that a small book of "Instructions for medical officers" should be issued, telling concisely their duties under various circumstances, how to go about them, and what equipment is proper. Its weight in gold would have been a very conservative estimate of the worth of such a book to me in the summer of 1898.

THE MAHAN BOARD IN ACTION.

By DUDLEY NEWCOMB CARPENTER, M. D.

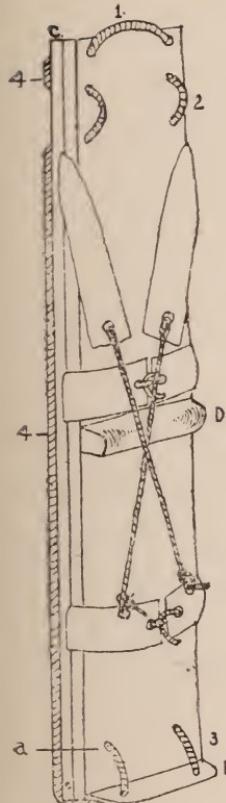
PASSED ASSISTANT SURGEON (LIEUTENANT J. G.) IN THE
UNITED STATES NAVY.

MEDICAL DIRECTOR C. U. Gravatt, U. S. N. called attention to this board in an article which appeared in the Proceedings of the Association of Military Surgeons of the United States for 1900, and he recommended its general adoption by the North Atlantic Fleet. The object of this present article is to emphasize the value of the board as the best solution we have at present, for the transportation of wounded on shipboard, and to point out certain changes which simplify its construction. In carrying out the suggestions that came to mind, Carpenter's Mate John W. Walker, now on this ship, who made these boards for Surgeon Ames, should receive full credit. The drawings explain themselves, but attention is called to the following differences in construction from those in general use.

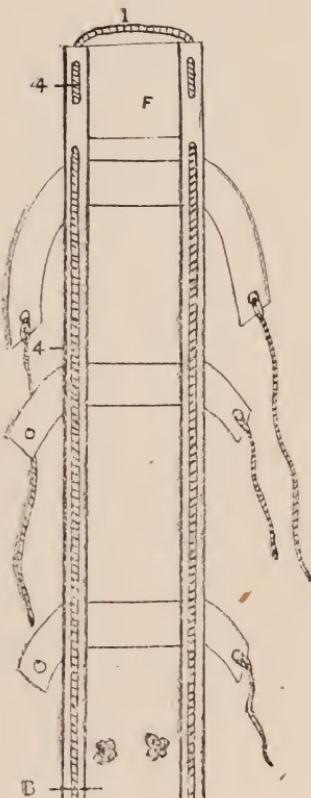
1. Narrow canvas bands with single buckle or lashing. These are sufficiently strong to answer every purpose, and are quicker to fasten.

2. A cross band instead of a thoracic belt. The advantages are that there is less pressure and confinement of the chest, which is of primary importance to an injured person, and also prevents slipping toward the head end of the board, should the foot end be suddenly raised. The buckles or fastenings of this cross band may be fastened to the pelvic or leg straps, which are provided with extra eyelets.

3. The rope is so reeved that it acts as handles for a level surface, takes up the strain of the entire body when the board is used to hoist wounded by the loop at the end, and running along the grooves in the wooden runners becomes an



Front and Side View



Back View.

Construction of the Mahan Board.

A—Pine board 76x14x1 inches.

B—Back of same showing straps beneath board and ends of rope.

C—Pine runners 76x2x1 inches, grooved for $\frac{3}{4}$ inch rope.

D—Pine buttock block 14x3x3 inches.

E—Pine foot-rest 14x4x1 inches.

F—Pine brace, head end, between wooden runners, 10x8x1 inches.

Canvas straps 5 inches broad, to fasten by buckle or lashing; slide between board and runner which is cut for them.

Reeving-rope $\frac{3}{4}$ inch Manila

1—End loop for hoisting, dragging and sliding.

2 and 3—Handles for lifting and carrying.

4—Buffers and runners.

Buttock-block, foot-rest, brace, and runners, screw on to board. The whole apparatus to be stained any color desired.

elastic buffer to break the jar if the board slides down a ladder or is set on the deck heavily.

Undoubtedly Surgeon Stitt's bar and hammock, that was adopted July 13, 1895, by the Navy Department, was the simplest solution of all the complicated apparatuses which had been devised for transporting wounded since modern ships have been constructed. This present board is only a further evolution of the hammock-method of transportation, for on some ships boards are used to cover the ladders, down which these hammocks slide; with this apparatus the straps take the place of the hammock and the board itself slides instead of being placed on a ladder.

In a similar manner Medical Director John C. Wise's Stretcher slid down boards placed over ladders.

In his article that appeared in the Proceedings of the Association of Military Surgeons of the United States for 1900, he mentions the following report of a Board of Officers; the suggestions of this Board for every apparatus to fulfill might well be taken for imperative canons.

1. Simplicity, speed of application, manipulation and transport.
2. Ease of stowage.
3. Usefulness for shore transportation.
4. Security of the occupant.
5. Suitability to present ship construction.

Those who have used this board can testify that it completely fulfills these requirements. Its simplicity of construction renders it possible to have as many boards on a ship as the number of the crew demands, and in time of action, these can be placed near the guns on each deck ready for use. At the hatch leading below is a rope which can be made fast to the end loop for lowering the board if necessary, but generally it will slide down the ladder, steadied by one man. On a level surface the side handles can be used to carry the patient. Wherever the bar and hammock can go this board can go; down below into the fireroom, through an air-lock, or up to the fighting tops by means of the ammunition whip. Its

advantage over the bar and ham nock lies in its simplicity for suspension and its use as a litter for sliding down ladders. In cases where a limb is fractured the board acts as a splint to prevent movement. On a level surface it is as easy to handle as any stretcher. One man can place another upon this board, and unassisted drag him to the nearest ladder by means of the end rope, the rope runners sliding smoothly over the deck. This advantage of transportation by one man is a feature of the "Ambulance Sleigh", recently described by Fleet Surgeon Gilbert Kirker, R. N. The only disadvantage of the board is that it does not fold and therefore is awkward to carry, if with a landing force ashore. It could be made to do so at the sacrifice of simplicity and strength by using canvas stretched between the wooden runners, and carrying out all other features of the apparatus. The Wise litter had to be used with a board when sliding down ladders and therefore no advantage would thus be obtained. The Mahan board is essentially for use, on a ship, in a boat, or for transporting wounded, from a ship or a boat, to the shore. Extended service with a landing force would require the folding litter, no better substitute having as yet been found by the Army.

U.S.S. Illinois, December, 1901.



Reprints and Translations.

SWORD WOUNDS OF THE HEAD.

BY CAPTAIN C. C. BARRY,

INDIAN MEDICAL SERVICE.

DURING four years' duty as Resident Medical Officer at the Rangoon General Hospital I have had to deal with a very large number of sword or *da* wounds, some 300 to 400 a year.

The reason for this is that the city of Rangoon is a large and populous one, and the General Hospital not only draws its cases from this city, but also from an outlying district some hundreds of square miles in extent.

In the district nearly every Burman carries a *da* or sword, and in the city a very large proportion of them possess one in their houses. The Burman, moreover, is of a very excitable disposition and uses his *da* on small provocation, and when he does so, he uses it with his full force.

The *da* in use is commonly of two kinds: the one in every day use for cutting jungle, chopping wood, &c., is square at the end and heavier and broader at the end than at the handle; and the other, used as a fighting weapon, is long, curved and pointed. Both are very powerful weapons, and with a little practice they can both be made to cut in a wonderful manner: in addition, also, both kinds of swords are kept very sharp.

As a consequence, a large and often a fatal wound can be inflicted with one good slash of a *da*. Sword wounds of the body and limbs have little of special interest, except that, as a rule, the operations for the repair of injury inflicted are long and tedious, including, as they often do, the wiring of divided bones and the suture of muscles, tendons and nerves; but it is sword cuts of the head and skull that are the most

interesting, and which present the greatest difficulties in determining what line of treatment it will be best to follow.

Sword cuts of the head vary in many ways. Some may be glancing cuts, removing entirely a shaving of skull with its adherent scalp, or a shaving of skull may be sliced off and left adherent by a flap of scalp; the shaving of skull, varying from any thickness up to that of the whole skull, or again the skull be cut through vertically with or without any accompanying depression of the skull. For particular treatment these injuries may be classified as below:—

- (1.) Complete removal of a piece of skull and scalp.
- (2.) Removal of a shaving of skull which remains adherent to a flap of scalp.
- (3.) Vertical wounds of the skull—
 - (a.) Partially through thickness of skull;
 - (b.) Completely through thickness of skull.
- (4.) Wounds accompanied by depression of the bone of the skull.

1. As regards complete removal of a piece of skull and scalp as long as the piece of bone does not consist of the whole thickness of the skull the wounds usually may be dressed antiseptically and do not require any further operation. As a rule, they do well and in one or two cases examined *post mortem*, there was no fracture or depression of the inner table of the skull. When, however, the whole thickness of the skull is removed, the wounds are generally very severe and do badly, for the brain is almost invariably injured, and *hernia cerebri* and *meningitis* are common.

2. In these cases in which a shaving of the skull has been cut off and remains attached to its flap of scalp the wounds usually do well, unless, as occasionally happens, the wound is very dirty, though, of course, the severity of the injury varies largely with the thickness of the skull cut off. In these cases also the inner table of the skull is, as a rule, uninjured.

It has been found best to re-adjust the flap, with its shaving of bone attached back into its original position with sutures through the scalp without further operation. But if, as

sometimes happens, the shaving of bone is so bent and distorted that the flap will not lie smooth and flat back in its original position, the piece of bone should be trimmed up with bone-cutting forceps till the flap can be made to lie easily and smoothly.

Again, should, as not infrequently happens, dirt have been so ground into the wound that it cannot be satisfactorily cleaned, it is, as a rule, best to remove the shaving of bone entirely from the flap thus ensuring thorough drainage, for it is often very difficult to allow for thorough and free drainage when adjusting a flap of bone and scalp, and should it appear likely that suppuration will ensue the shaving of bone is best removed.

3. By a vertical wound of the skull is meant a wound occasioned by a blow delivered at right angles to the curvature of the skull at the point of receipt of the injury. These wounds naturally occur chiefly on the vertex of the skull, but may occasionally be delivered laterally.

This class of wounds is especially important owing to the resulting injury to the inner table of the skull and also possibly as a consequence to the brain substance beneath.

These wounds may, for the purpose of treatment, be again subdivided into three minor classes:—

- (I) Wounds in which the outer table of the skull is cut into, but not completely divided.
- (II) Wounds dividing the outer table and cutting into the middle or cancellous table of the skull.
- (III) Wounds completely dividing the skull.

It is in wounds of the above nature that the question of the operation of trephining most frequently arises, and it is often a very difficult question to decide. The following views have been arrived at after the performance of a considerable number of *post-mortem* examinations and as the result of numerous experiments on the dead body.

In the first place it is of great importance to estimate whether the blow was received at right angles to the curvature of the skull or not. Many blows, though struck vertically, on coming in contact with the skull, glance sideways,

and whether this has taken place or not can almost always be determined by a careful examination of the wound itself.

Should therefore the blow be a glancing one, and should there be no grave head symptoms pointing to compression or severe injury of the brain substance, the wounds in Classes I and II, as a rule, require no operation and may be treated as ordinary scalp wounds exposing the bone of the skull. Should, however, the direction of the wound be at right angles to the curvature of the skull, wounds in Class I only may be left alone.

Those, however, in Class II under these circumstances require more thorough treatment, for there is almost invariably fracture and comminution of the inner table of the skull, and, as a consequence, not infrequently laceration of the brain substance beneath.

In wounds falling into Class III, I should always advise trephining and thorough examination of the wound whether the blow happens to have been actually vertical to the curvature of the skull or not. The inner table in these cases also is almost always comminuted and fractured, and till the wound has been thoroughly searched it is, as a rule, impossible to discover what is the true condition of affairs inside the skull.

In illustration of this point, I would mention a case happening recently. A Burman came to the hospital suffering from a *da cut* of the skull, $4\frac{1}{2}$ inches long on the vertex of skull, just above and more or less parallel to the temporal ridge. The blow had apparently been delivered at right angles to the curvature of the skull. For the posterior two-thirds of the wound the skull was cut clean through, for the anterior one-third the skull was cut deeply into but not completely divided. The patient had no head symptoms and walked to hospital being, however, weak from loss of blood. A crown of bone was removed and the whole line of the wound cut along with the bone-cutting forceps. Under the anterior one-third of the wound was found a loose piece of inner table $\frac{3}{4}$ inch long and $\frac{1}{2}$ inch wide driven downwards and inwards through the *dura mater* and lacerating the brain substance. This, together with several small separated fragments of inner table was removed. The patient, 14 days after receipt of the injury, was practically well, the temperature had only once risen above normal (just after the operation); the wound

had healed up, and he had no head symptoms at all. It was hardly to be hoped so successful a result would have been possible had not the wound been thoroughly explored in the manner above described.

4. Incised wounds of the skull with depression of the bone should be treated as ordinary compound depressed fractures of the skull, and the depressed bone elevated, and, if necessary, removed. Two years ago, in quoting the notes of 26 operations for compound depressed fractures of the skull performed at the Rangoon Hospital by Captain Duer and myself, attention was drawn to the good results obtainable by a free removal of the bones of the skull as a means of ensuring a thorough knowledge of the condition of the inner-table of the skull and the brain, and also for allowing for free drainage of the wound where necessary. The advantages of this free removal of bone have been fully borne out by subsequent cases. Several of the cases operated on have been seen at periods varying from one to three years after the operation, and the resulting inconvenience from the removal of even large areas of bone has been surprisingly small, and has in no case prevented the patient from following his previous occupation.

Should there therefore, in incised wounds of the skull, be any reasonable probability of the inner table of the skull being fractured and depressed it is, I believe, the best practice to operate at once and settle the question definitely.

The method usually followed has been to first remove a crown of bone with a trephine and then to quickly remove a strip of bone along the line of the incision in the skull with bone-cutting forceps (Stoffman's).

A probe bent at right angles is then passed along either side of the incision in the skull, and where fractured or depressed bone is felt more skull is cut away and the fragments of inner table removed and the condition of the brain thoroughly examined.

The scalp is then sewn up with sutures, and after extensive operations the wound is drained for 24 hours.

With the aid of powerful bone-cutting forceps, an operation of this nature can be quickly performed. — *Indian Medical Gazette*.

TYPES OF BULLET WOUNDS AS SEEN IN THE SOUTH AFRICAN CAMPAIGN.

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ABULET wound is essentially a "penetrating" or "perforating" wound, but it differs most materially from penetrating wounds inflicted by sharp-pointed instruments, such as knives or trocars. This difference is due chiefly to the velocity of the projectile, and to a lesser degree to its bluntness, the consequence of these conditions being that all bullet wounds partake of the nature of contusions, and that, as a corollary, the tissues are liable to be injured beyond the immediate track of the bullet to varying distances.

ENTRANCE AND EXIT WOUNDS;—DIFFERENT KINDS OF BULLETS.

Typical Wounds Caused by Normal Small-bore Bullets.—A perfect, undeformed, small-bore bullet entering at right angles to the surface makes as a rule a round hole slightly smaller than the bullet itself. Around this aperture is a narrow ring about one-sixth of an inch in breadth, from which the cuticle has been removed, and which appears some hours after the receipt of the injury as a red border to the wound. A little later this ring, as well as the actual hole, is covered with a dark scab, which consequently is larger than the hole which it covers. The bullet in its passage inwards pushes in front of it the skin, which is thus brought into contact with the sides of the bullet and bruised by it. The projectile then passing on, stretches and perforates the skin, and gains admission through a hole which is smaller than the actual diameter of the bullet.

Atypical Wounds caused by Normal Small-bore Bullets.—When the axis of flight of the bullet is inclined at less than a right angle to the surface, the wound in the skin becomes oval, and the breach of surface therefore is slightly bigger. When the angle is very oblique the bullet traverses a certain track of skin, depressing it more and more until actual perforation takes place. The skin, therefore, is bruised and the cuticle destroyed for some distance from the aperture of entrance. This damaged area of skin shows as a red, raw place when the wound is recent.

The shape of the contused area is roughly that of an isosceles triangle with a rounded apex, and the sides are slightly bent outwards. The base is formed by the perforation in the skin. The breadth is often more than that of the actual bullet.

Bullets passing out through the skin obliquely make an oval aperture of exit, and this, if the line of flight is greatly inclined to the skin, is often of large size, but still remains oval. The skin is evidently pushed out and then burst. The width of such a wound is rather striking, and is due to the skin being unsupported and to the natural elasticity of the cutis causing retraction and gaping. It has been thought by some that such wounds are due to the setting up of expanding bullets, but the evidence does not confirm this, for in multiple wounds caused by the same bullet the second aperture of entrance is often quite round and small, although the first exit wound is large and slit obliquely. Some of these oblique wounds have measured 1 inch by $\frac{1}{2}$ inch and even more.

When a bullet traverses the surface of the skin so as to make a long graze it causes a surprisingly wide area of damage.

The following is a good example of this damage:

A soldier was shot while lying down. The bullet came from the front, and perforated the skin over the spine of the right scapula, then emerged, leaving a bridge of skin a third of an inch wide, and travelled down the surface of the body for 4 inches. The resulting slough was the same length, and at least $\frac{3}{4}$ inch broad at its widest place; from here it gradu-

ally tapered off. When the slough separated the surface refused to granulate, and was not healed at the end of a month from the receipt of the injury.

Ricochet Bullet Wounds.—In these cases the wounds lose more or less of their typical character according to the amount and kind of distortion the bullet has undergone. The round, oval, or slit-like wound becomes irregular, torn or jagged, for even if not greatly distorted after striking the ground, the bullet no longer continues to have its long axis in the axis of flight, and so may strike the body with its side, or partly with its side and base. In such cases the length of the wound will vary according to the actual position of the projectile at the moment of its impinging on the skin. Fragments of stones struck by bullets will also cause jagged irregular wounds. This is especially the case when the bullet strikes the body where it is in contact with the ground.

F. H. was wounded at Paardeberg on February 18th. He was lying down under a cross fire. The bullet entered just by the left anterior superior spine, and caused a lacerated wound $1\frac{1}{2}$ inch long. The clothes over the entrance aperture were also torn to a like extent. When the patient was dressed there was a wound just over the femoral artery, but of small extent and slit like. On March 19th the wound near the anterior superior spine was granulating healthily, and the slit over the femoral artery was healed. A hard core could be felt to join the two. The x-ray picture showed a bullet lying with its point towards the symphysis pubis under the groin wound. The bullet was found lying under the skin in the midst of gritty pultaceous material within a fibrous capsule. It was slightly flattened and grazed. The nickel plating was chipped off on one side at the base.

The explanation of this case seems to have been that the bullet hit the ground and the body almost at the same time, thus causing a large aperture of entrance, and then passing in it bruised the tissue against the ground, and finally lodged. Retained bullets were found under three conditions as regards the surrounding structures.

1. When extracted shortly after the receipt of the wound the bullet was lodged in a ragged blood-containing cavity.
2. Somewhat later a fibrous capsule was found, and

within this was the projectile surrounded with serous fluid.

3. At a since later period the fibrous capsule was found to have shrunken on to the bullet which it closely surrounded.

A certain number of lodged bullets were found, when extracted, to be lying inverted, with their apex towards the aperture of entrance, which was usually of the typical form, though contact with bone could in many instances be excluded. The explanation must be sought outside the body, and is due to one of two causes. In some cases it is the result of a ricochet.

In another class of case the turning over of the bullets is due to the wearing away of the grooves of the rifling by frequent firing; this was probably the cause of a bullet, which was extracted at the Portland Hospital, having entered the arm base first, for the projectile was quite smooth, and showed only the barest trace of the rifling upon its surface. It is the rapid twist of a long bullet that alone prevents it from turning head over heels soon after it leaves the rifle, and, if the spin imparted to the bullet be not sufficient it will soon commence to turn over on a transverse axis, and thus may actually enter the body base first.

"EXPLOSIVE" WOUNDS.

These wounds are practically always met with in connection with fractures of bone. There is no hard and fast line to be drawn between an ordinary typical Mauser wound and those that have been termed explosive, and all gradations are met with between the small round puncture of the former and the yawning opening of the latter. The wounds shown in slides [exhibited] are cases in point. It will be seen that these apertures are large and irregular. The entrance wounds were perfectly typical. There was no evidence to show that the bullets were anything else but perfect, small calibre bullets, and there was no sign of any fracture of bone. The bullets here emerged at an acute angle, and to this must be attributed the character of the wounds.

The extent of the exit wound, it must be borne in mind, has no invariable definite relation to the underlying damage,

although it may afford valuable indications thereof. The introduction of a finger will often show that although the exit aperture may be large, the skin is so undermined and the muscles so torn that a still larger irregular cavity is formed into which the ends of the fractured bone protrude, and this was especially well shown in cases of fractured femur.

Another form of wound is that in which the skin is blown away to a great extent. This is likely to happen if the bullet emerges from a subcutaneous bone, as the shin, and then there is a definite loss of substance so that a crater-like wound results.

A third form is that in which the muscles and tendons are torn, and at the same time extruded through the skin wound and form a protruding mass above the level of the skin resembling in some degree a fungating sarcoma, especially if seen for the first time some days after the infliction of the wound.—*British Medical Journal*.



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Editorial Department.

SURGEON GENERAL GEORGE MILLER STERNBERG,
UNITED STATES ARMY.

DURING a period so momentous in its history as the time of the Spanish American war, the United States army was fortunate in having at the head of its medical department a man of unusual versatility, energy and efficiency. The transformation of the conduct of affairs from the era of small things and close estimates consequent upon three decades and more of comparative peace to the liberal basis demanded by the people in the treatment of the sick of the army so quickly created and mobilized to relieve the struggling Cubans was accomplished by him with singular ease and success. Brigadier General George Miller Sternberg had been prepared for such administrative duties by six years of service as surgeon general, preceded by thirty-two years of work in the lower grades of his corps. He had qualified himself for scientific direction by professional experience extending over territory bounded only by the limits of his country and involving practical work upon the battle-field and amidst epidemics of disastrous character, and by profound special investigations into the cause of disease conducted in this country and abroad. The high character of his work had been attested by the official commendation of his commanding general for service at Bull Run, Gaines' Mill and Malvern Hill, by the hearty approval of the chief of his corps for service in the south and in particular during two epidemics of yellow fever, and by the reception of a brevet for gallant service in the performance of professional duty under fire in action against Indians.

The depth and scope of his professional work is indicated by the number and extent of his contributions to professional literature. His work on Bacteriology now in its third edition is recognized as a classic, of which his edition of Magnin's Bacteria was a worthy precursor; his monographs upon yellow fever have added greatly to the reputation of American research; his studies in croupous pneumonia, typhoid and cholera were epochal in character; his investigations into disinfection and his original work in connection with pathogenic micro-organisms have been of the highest value; his book upon Malaria and Malarial Diseases together with his journal articles upon the subject, form a peculiarly well-rounded compendium of the subject; while his work upon Serum Therapy has been crowned with the highest praise.

His professional standing has received abundant recognition at the hands of the profession. He has twice received the degree of LL.D. and has been made an honorary member of the Epidemiological Society of London, the Royal Academy of Rome, the Academy of Medicine of Rio Janeiro, the American Academy of Medicine, and the French Society of Hygiene, while also honored from time to time by election to the presidency of the American Medical Association, the American Public Health Association, the Biological Society of Washington, the Philosophical Society of Washington, the section on military medicine and surgery of the Pan American Medical Congress and the Association of Military Surgeons of the United States, of the latter of which he has always continued to be an active and interested member.

He founded the Army Medical School, and inaugurated the custom of assigning officers to stations in large cities where they might have the advantage of abundant laboratory and clinical facilities. He established the laboratories of bacteriology and hygiene in connection with the army medical museum, and furnished facilities for such work in every military post. He encouraged scientific work by the members of his corps and brought the medical staff of the army to the highest state of professional efficiency. His frequent tours of

inspection, including Cuba and the Philippines in his itinerary, have given him a personal familiarity with the needs of the service which has never failed to redound to the advantage of the officers under his direction.

General Sternberg has from the beginning evinced great interest in the work of the Association of Military Surgeons and during his presidency the membership made its greatest strides in numbers. When the Spanish war required an increase in the medical staff, he selected the new officers largely from the Association membership, believing that the training and instruction gained in the work of the Association conducted greatly to the efficiency of its members and adapted them markedly to active service.

The declaration of war with Spain found him ready, and in the face of great legislative embarrassments and administrative obstacles, he conducted the system of aid to the ill and injured with singular efficiency. The enormous addition to his labors due to a sudden multiplication of the combatant force by ten and the retention of the permanent strength at four times the *ante-bellum* number has been met by him readily and easily. Performing duties many times more arduous and responsible than those of a Major General, he has remained a Brigadier General although the medical profession of the country has unanimously urged the advancement of the surgeon-generalcy to the grade of Major General, the American Medical Association and many other organizations adopting without solicitation resolutions to that effect prepared by the writer during his first term as Secretary of the Association of Military Surgeons.

He instituted a corps of female nurses for service in permanent hospitals; he established a sanitarium at Fort Bayard for the treatment of pulmonary tuberculosis; he created a special surgical hospital at Washington Barracks; he organized additional schools for the hospital corps and developed and improved those already established; he accorded special facilities of many kinds in medico-military work at numerous points throughout the country; he supervised the organization in our tropical and uncivilized dependencies of a system of

care of the disabled so efficient as to result in a sick rate so low as to be unprecedented in history.

He has been eminently a man of works, and his accomplishments along administrative, scientific and professional lines have made an impression in history that will never be forgotten.

JAMES EVELYN PILCHER.

RECENT PROBLEMS IN MEDICO-MILITARY ADMINISTRATION.

In a recent address before a meeting of the medical officers of the Ninth Corps of the German army, Generalarzt Meisner discussed fully and eloquently the advances in medico-military affairs during the past century. He compared the conditions of the present with the past, much to the advantage of existing conditions.

A hundred years ago, medical aid never arrived until the battle was ended. Larrey, it is true, had established his *ambulances volantes*, but they had not been adopted to any extent even in the French army. It was not yet known that prompt aid would save a large proportion of those injured by the arms of that day, and even had it been realized, the kinder spirit of future times had not yet emerged to incline the combatants to make such efforts. The nineteenth century, indeed, has made many advances along the line of relief to the sick and injured, but there still remains ample work for the progressive medical officer of the twentieth century.

This has recently been conspicuously brought before the medical profession of the country by means of a valuable paper read before the Cincinnati Academy of Medicine by Major W. O. Owen of the army. Major Owen, in a very modest and repressed fashion, directed attention to the evils of administration of medico-military affairs when controlled by officers of the line. His instances of damage to the health of military commands through the presumption and sanitary ignorance of certain officers of the line might have been multiplied a hundred fold, although it is proper to remark that this con-

dition is not the rule but the exception, the majority of line officers of the army being most favorably and kindly disposed toward all efforts designed to benefit the sick and injured soldier. There are enough exceptions to this attitude toward the work of medical officers, however, to involve our forces in danger of most serious disaster. The evil results of the failure of medical and surgical supplies to reach Tampa in time for the invasion of Cuba have been dwelt upon, but the fact that the predecessor of the general who commanded that force declined to permit the establishment of other than regimental hospitals is not so widely known.

The conclusions of Major Owen are embodied in "an Act to define the duties of the Medical Department of the Army of the United States," which specifies particularly that the Medical Department shall have charge of—

"1. The direction of measures for the prevention of the ingress of disease among the troops of the army and of sanitary faults in location, construction (and management) of posts and camps,

"2. The medical and surgical care of diseased and injured officers and soldiers of the army of the United States; the physical examination of all officers and soldiers entering or leaving the army of the United States,

"3. The care (of) and accountability for all transportation pertaining to the movement of men and supplies of the Medical Department and (of) the sick and injured of the army,

"4. The preparation and preservation of the records of transactions taking place under the three preceding paragraphs,"—

and provides in addition for the trial and punishment of either the medical officer or the commanding officer at an infected point in case an unusual outbreak of disease shall have been shown to be due to his carelessness or inattention. These propositions of Major Owen cannot but meet the approval of every progressive student of military sanitation.

A further defect in the system of aid to the sick and injured, and which also participates largely in the causation of failures to properly administer the care of sick and wounded soldiers, is the insufficient number of trained military medical

officers available for service. This fact will undoubtedly be fully discussed and demonstrated in the essays soon to be submitted in the competition for the Enno Sander prize. It is worth while, however, to mention here the work of the Committee on Legislation formed by the medical officers stationed in the Philippine Islands, than whom none are able more fully to appreciate the embarrassment to the medical corps and the damage to the service of the sick and injured inflicted by a paucity of medical officers of suitable training and education. These gentlemen have prepared an act* to remedy this defect in the present organization of the medical department.

The statement accompanying this proposed legislation is so cogent and impressive that it is worth reproducing for the information of our readers. The object of the act, the argument states, is to provide, primarily, for a more satisfactory rate of promotion, and to serve as an inducement for capable and desirable candidates to enter the Medical Department of the United States Army. The law now in force, provides for such a large number of the lower grades and small number of the higher, that it has been found impossible to induce a sufficient number of candidates to present themselves for admission to the Medical Corps. There are about seventy vacancies, and although since the passage of the act of February 2, 1901, Examining Boards have lowered the standard of examinations, there appears no prospect of a possibility of attracting a sufficient number of properly qualified young men, to considerably reduce this very large percentage of vacancies.

Under the older organization of the Medical Corps, an As-

*AN ACT TO INCREASE THE EFFICIENCY OF THE MEDICAL DEPARTMENT OF THE UNITED STATES ARMY.—Be it enacted by the Senate and House of Representatives, of the United States of America, in Congress assembled, that from and after the approval of this Act, so much of Section 18, of Act 4300, approved February 2, 1901, as provides as follows.

"Eight Assistant Surgeons-General, with the rank of Colonel, twelve Deputy Surgeons-General, with the rank of Lieutenant-Colonel, sixty Surgeons, with the rank of Major, two hundred and forty Assistant-Surgeons, with the rank of Captain or First Lieutenant," shall be and is hereby amended to provide as follows:

Ten Assistant Surgeons-General, with the rank of Colonel, twenty Deputy Surgeons-General, with the rank of Lieutenant-Colonel, eighty Surgeons, with the rank of Major, two hundred and ten Assistant-Surgeons, with the rank of Captain or First Lieutenant.

Provided, that all other provisions of the said Section 18, Act 4300, shall remain in force, and that nothing in this Act shall be held or construed to change any other portion of said Act 4300, approved February 2, 1901.

sistant Surgeon served eighteen to twenty years before obtaining promotion, but under the present organization, the junior officers of the Corps will be required to serve upwards of thirty years before reaching the grade next above that of Assistant Surgeon, and in case they reach this rank prior to retirement, they would certainly be retired with the rank of Major. Former legislation provided for promotion which compared fairly favorably with the other branches of the service, and as there was a reasonable prospect of reaching the grade of Colonel before passing upon the retired list, naturally an active competition for admission to the Medical Corps prevailed. The Army Reorganization Act of 1901 has now so greatly increased the lowest grade, that the incoming Assistant Surgeon cannot hope to attain the grade of Lieutenant Colonel before retirement, and it is probable that many will fail to attain even that of Major, and be compelled to go upon the retired list as Captains, after many years of service. The Medical Department is graded for rank, promotion and pay below every other staff department in the army, and, with the exception of Second Lieutenant, is graded below the line. A medical officer under the provisions of the present law, to obtain a Colonelcy, must pass through three times as many files as an officer of the Quartermaster's, Subsistence or Pay Departments; through more than twice as many files as an officer of the Engineer or Ordnance Departments, and more than one and one-half times as many as an officer of the Signal Corps. Officers of the line, having attained the rank of Major, have to pass through but four files to obtain the rank of Colonel, while the medical officers have to pass through nine files.

All these facts are fully appreciated by the younger physicians of our country, and by the Volunteer and Contract medical officers, hundreds of whom are now serving with troops and they are declining to become candidates for a position offering such an unpromising career and so little in the line of promotion and emolument.

The health of the army lies at the foundation of the efficiency of the Medical Department, and if the latter is crip-

pled, it follows as a necessary corollary, that the sanitary supervision of the troops, and their care in illness and injury must necessarily suffer. The medical officer is found at every possible point of danger, among the diseased in hospitals, shoulder to shoulder with the men on the firing line, and in his humanitarian mission, has frequently succumbed to the ravages of infection and disease, or fallen a victim to the enemy's bullets on the battle field. Since he, as a member of the military establishment, is of equal importance with the members of other staff departments and of the line, there should be extended to him the same opportunities for promotion that are found in other branches of the Army.

To correct this condition an increase of two Colonels, eight Lieutenant Colonels and twenty Majors, a total of thirty, and, as an offset, a decrease of thirty Assistant Surgeons is proposed, thus maintaining the same number of medical officers that now constitute the Medical Department, and the same ratio as formerly existed.

If any misgivings should be felt that there are not abundant and suitable posts of duty for these officers of higher rank, the following named stations are cited as proper and commensurate posts of duty for all the Colonels and Lieutenant Colonels now in the service and the additional ones contemplated by the proposed act:

STATIONS FOR COLONELS.		No.
Headquarters Division of the Philippines	- - - - -	1
Headquarters, 12 Departments: ten in U.S., two in Division of the Philippines	- - - - -	12
Surgeon-General's office	- - - - -	2
Curator of Army Medical Museum	- - - - -	1
Total	- - - - -	16
STATIONS FOR LIEUTENANT COLONELS.		No.
Headquarters seven (7) separate brigades, each brigade comprising from 3,000 to 12,000 troops	- - - - -	7
Surgeon-General's office	- - - - -	2
Four Medical Supply Depots	- - - - -	4
Presidio General Hospital, San Francisco, Cal.	- - - - -	1
Army and Navy General Hospital, Hot Springs, Ark.	- - - - -	1
First Reserve General Hospital, Manila, P. I.	- - - - -	1
Artillery School, Fortress Monroe, Va.	- - - - -	1
Infantry and Cavalry School, Fort Leavenworth, Kans.	- - - - -	1
U. S. Military Academy, West Point, New York	- - - - -	1
Attending Surgeon, Washington, D. C.	- - - - -	1
Soldier's Home, Washington, D. C.	- - - - -	1
Total	- - - - -	22

There exists then a total of thirty-eight places for the thirty officers proposed, still further reduced by the allowance of five per cent which must be made for sickness, leaves of absence and other contingencies.

The re-adjustment of grades suggested will provide for satisfactory promotion and induce many competent civilian, Volunteer and Contract Surgeons to present themselves for admission to the Corps, who are now deterred from so doing by the gloomy outlook. It is believed to be certain that unless the relief asked for is accorded, the Army Medical Corps cannot be filled with well qualified physicians, and that the military service in the end will be seriously embarrassed.

The facts thus stated by the committee on legislation of the medical officers on duty in the Philippines are cogent and convincing, and involve but a modest rehearsal of the real conditions, demands and dangers threatened by a continuation of the present perilous situation, and the movement should meet with the hearty cooperation of every military surgeon.

The development of a Public Health Corps, as contemplated in the reorganization of the Marine Hospital Service, also looks toward the improvement of the system of medical aid in military and naval work. The proposed act also brings out the desirability of greater harmony in organization and administration between the various public services, the projected military features of the new corps being entirely in line with this desirable consummation.

One of the objects of the Association of Military Surgeons is to bring about unity of action in the various medical services, and to more fully accomplish this, the establishment is urged at an early period of a standing committee on legislation, composed of the most active, influential, and alert members of the Association, who shall unite with the various services in organizing and supporting the enactment of legal provisions for the perfection of our system of medical care for the injured and afflicted soldiers and sailors.

JAMES EVELYN PILCHER.

THE SWEDISH ASSOCIATION OF MILITARY SURGEONS.

THE Association of Military Surgeons of Sweden celebrated its quarter-centennial in July, 1900. It was organized as the result of an invitation by Surgeon General Edholm at the rooms of the Military Society in Brunkberg's Hotel in Stockholm. Forty-one medical officers responded to the call and formed an association with the objects of establishing a literary center for Swedish military surgeons, to advance military medicine and to promote and develop military hygiene and the care of the sick. A constitution was adopted and it was decided to publish a journal and to collect a library. During the twenty-seven years that have passed since the establishment of the Association it has consistently advanced along the lines of work laid out, and has been a material inspiration to the development of special studies both by general cooperation throughout the entire Association and by mutual assistance in district branches.

A relief fund has been established by annual contributions, bequests and donations, so that it is now very considerable in amount. By means of the income derived from it, the Association has been able to render much aid to needy widows and daughters of deceased medical officers.

A recent publication* celebrates the quarter-centennial *festschrift* by an illustrated biography of each member. The portraits are small but clear and the biographical notes constitute an outline of the official history of the various individual members, and form a most attractive and instructive work. The Journal of the Association, the *Tidskrift i militär Hälsovård* has been successfully published for twenty-seven years and has been a continuous and effective source of inspiration to the membership. It is worth noting that in Sweden, *esprit de corps* is particularly strong in the military medical department, a fact mainly attributable to the influence of the Association.

JAMES EVELYN PILCHER.

**Svenska militärläkareföreningen. 1875-1900. Porträtt och Biografier.*

“AN EXAMPLE WORTH FOLLOWING.”

THE Association highly appreciates the compliments paid it, in connection with the establishment of the JOURNAL and begs to tender its thanks to the many kind friends who have spoken so kindly of its efforts to promote the science of military surgery. The *United Service Magazine* of London, in course of a particularly comprehensive and appreciative review, remarks that “it is hoped that the example of the military surgeons of the United States will be followed by the Royal Army Medical Corps.” *Le Cadeucée* of Paris publishes an appreciative comment under the caption of this note, remarking that, “judged by this [the ninth] volume, such meetings are most profitable, not only because of the instruction afforded to military surgeons but because of the progress developed in Medico-Military science.” It may be interesting to state that great interest in the work of this Association is also manifested by our own officers, the accessions to membership during the first half of the present year having been nearly double the number received during any previous entire year.

THE MASSACHUSETTS VOLUNTEER MILITIA
SCHOOL FOR MEDICAL OFFICERS.

TWO collections of brief papers show the character of the work done in as many sessions of the Massachusetts school for medical officers held in December 1900 and April 1901 respectively. Eleven papers were read at the former and fourteen at the latter session. They cover a wide field and indicate a high degree of interest in medico-military affairs and an equally high degree of ability to treat them. Eleven of the papers pertain to military hygiene, ten to medico-military administration, three to military surgery and one to military medicine, although the fields of medicine and hygiene overlap so much that there might be a difference of opinion

as to the proper place of some of those so enumerated. Massachusetts is to be congratulated upon the fine showing made in the work of her school

THE PROGRAM FOR THE NEXT MEETING.

THE Literary Committee has already been notified of the titles of a very satisfactory number of papers in preparation for the next meeting of the Association and there is every prospect of a full and interesting program. It is proposed to make the discussion of the more important topics presented a prominent feature of the exercises, but to do this requires time to make the necessary arrangements. The Committee earnestly requests, therefore, that each writer will, unless he has already done so, notify some member of the Committee, or the Chairman, Col. C. H. Alden U.S.A. retired, Newtonville, Mass., of the subject selected as soon as practicable. Such information should be received not later than April 25, 1902, in order that as full a program as practicable may be announced in the May JOURNAL.

BOLO WOUNDS.

IT is desired to make a collection of experiences with bolo wounds for the information of the Association. Surgeons having had such cases under observation are urged to forward accounts of them with or without remarks, to the editor of the JOURNAL.

Reviews of Books.

PRELIMINARY NOTICE OF THE THIRD EDITION OF SURGEON GENERAL STERNBERG'S BACTERIOLOGY.*

THE very important role which micro-organisms play in the work of the military surgeon renders the production of a treatise on the subject by an eminent military medical officer especially appropriate. With the first edition of his work, which appeared as "A Manual of Bacteriology," General Sternberg at once became widely recognized as the standard authority on Bacteria. The second edition,—in which the attempt to include all species or distinct varieties distinguished at that date was abandoned, and from which the bibliography and the descriptions of many non-pathogenic species were omitted in order to permit of the introduction of much essential new matter,—differed so materially from the first that it was considered deserving of a new name, and was called the "Text-Book of Bacteriology." A third edition now appears as the "second revised edition" of the latter.

In order to avoid in this edition the unwieldy bulk, which it would have attained through the recent growth of the subject, still other matter of minor importance has been excluded and room has been made for much new information, particularly in two new chapters on the "Bacteria of Plant Diseases" and "Protective Inoculations in Infectious Diseases" respectively. The plan of presenting the text in two sizes of type, distinguishing the more important and less essential facts is an admirable feature of the work, well worth imitation by every writer on scientific subjects, and renders the use of the book as a work of reference much more convenient.

***A Text-book of Bacteriology.** By GEORGE M. STERNBERG, M.D., LL.D., Surgeon-General United States Army. *Second revised edition.* roy 8vo. pp. xii, 708. 198 illustrations. New York: WILLIAM WOOD & CO. 1901.

Of the new chapters, that on Protective Inoculations is the most immediately practical in its application and concerns itself with every affection in which the method may be concerned, including:—

Anthrax,
Bubonic Plague,
Chicken cholera,
Cholera,
Diphtheria,
Foot and Mouth disease,
Glanders,
Hog cholera,
Hog erysipelas,
Hydrophobia,
Influenza,
Influenza in the horse,
Pleuro-pneumonia in cattle,
Pneumonia,
Rinderpest,
Swine plague,
Streptococcus infection,
Symptomatic anthrax,
Tetanus,
Tuberculosis, and
Typhoid fever.

The discussion of protective inoculations in these afflictions is comprehensive and detailed, comprising nearly a hundred pages and amounting to a complete treatise in itself upon serum therapy. The value of the practice in cholera is discussed and the opinion expressed that immunity in man may be accomplished by the ingestion of considerable quantities of sterilized cultures, although the matter still lies open for further investigation. Immunization against diphtheria is fully and favorably considered, but in typhoid, "this method should not be relied upon as a substitute for those sanitary measures which must be our main reliance for the prevention of epidemics of this disease, viz., sterilization of drinking water, disinfection of excreta, sanitary police of camps, etc." Hydrophobia brings out a discussion of the experiments in the Pasteur laboratories and the results and conclusions derived therefrom, and encouraging but non-evidential reports are

quoted with regard to the treatment of tetanus and tuberculosis.

The comprehensive and systematic character which renders the book serviceable alike as a laboratory guide, a textbook for the student, and a work of reference for the practitioner, is fully maintained in the other chapters, each of which has been thoroughly revised and brought up to date. The text is profusely illustrated with numerous accurate and graphic illustrations in black and in colors and is in no respect wanting in the qualities necessary easily to maintain its position as the chief authority on the subject of which it treats.

JAMES EVELYN PILCHER.

SURGICAL AND MEDICAL HISTORY OF THE JAPAN-CHINESE WAR.*

THE publication of this report in English by the Japanese Naval authorities is stated by them in the preface to be due to a sense of "duty to the medical profession. * * Much has been written about the wounds received in wars on land, indeed the Medical and Surgical History of the American Civil War is full of interest and information. Of naval warfare we possess no medical history; the lessons of Trafalgar and Lissa, and war between Chile and Peru have been lost to us, and there has been no previous experience of the treatment of wounded on ships since the modern revolution in naval warfare."

This is a large, well-bound volume of 544 pages, translated into excellent English by Dr. Suzuki and unusually free from typographical errors. The book contains a number of good illustrations in colors, by Japanese artists, of wounds and injuries received in the Japanese naval forces. It may be said at the outset that the work reflects much credit on the medical authorities of the Japanese Navy, and impresses the

*The Surgical and Medical History of the Naval War between Japan and China, during 1894-95. Translated from the original Japanese report by S. Suzuki, Deputy Inspector General of Hospitals and Fleets, Tokyo. 1901.

reader with the marvelous progress made along scientific lines by the Japanese nation since it was opened up to modern civilization by United States warships scarcely a generation ago. The book contains much valuable information which will not be found elsewhere, and should be read not only by naval surgeons, to whose work in warfare the subject matter is especially applicable, but also by medical officers of the military arm of the service, who are liable to observe wounds of a character similar to those seen in naval warfare after artillery duels, during sieges or as a result of bombardment of land fortifications by hostile fleets.

In character, the wounds observed during the Chino-Japanese War were practically limited to such as would be produced by large projectiles, fragments of exploding shells, fragments of metal and wooden splinters. In addition, a considerable number of burns and scalds were incurred. The total number of cases of wounds and injury was relatively small—amounting to but 371—but these cases were so studied by the Japanese authorities as to be of more value than a larger number of cases less carefully elaborated. The book consists of nine sections, each divided under numerous sub-headings. Section I deals with the various battles of the war, with the injuries resulting therefrom. Section II gives a history of the killed and wounded, classified by regions. Section III is of a statistical nature, dividing the killed and wounded into groups according to varying conditions. Section IV relates to the causes of the wounds received, and the characteristics of the wounds as dependent thereon. Section V treats of the complication of wounds observed. Section VI relates to the management of the wounded on ship-board. Section VII discusses the diseases experienced on board ship during the war, together with such wounds or injuries as were not the result of warfare. Section VIII treats of the sanitary conditions influencing the health of the command during the war. Section IX is devoted to a consideration of the work done in the various naval hospitals during the war.

The general scope of the book is indicated by the above

sections, but it is impossible, in the space of a brief review, to touch upon the many individual points of interest which the work presents. One can only say that the book is a noteworthy addition to the scanty literature of the special subjects of which it treats, and that it should be carefully studied by medical officers of our naval and military forces, who are under many professional obligations for this latest work of their confrères of the Japanese Navy. The book is a Government publication and is understood not to be on general sale, but copies have been distributed to the larger libraries, where they will be available for reference. EDWARD L. MUNSON.

THE RECENT SURGICAL WORKS OF COLONEL NICHOLAS SENN.*

THE abundance in good works of the author is particularly manifest in the appearance of three new books under his name during the brief period of twelve months,—a new and minutely revised edition of an earlier work, a carefully edited American version of a classical treatise by a distinguished German colleague, and a comprehensive presentation of the practical ideas and methods matured by a quarter of a century of study, practice and experiment in peace and in war.

In reviewing the first edition of the *Principles of Surgery* twelve years ago, the writer remarked, the book "affords a superb illustration of his [Colonel Senn's] art of clear presentation." In the editions that have succeeded, this characteristic has continued to a conspicuous extent. This feature is so important, and so deficient in many otherwise valuable

**Principles of Surgery*. By N. SENN, M.D., PH.D., LL.D., *Third edition*. Svo, pp. xiv, 699, Philadelphia, F. A. Davis Co., 1900.

Surgical Technic. By FR. von ESMARCH M.D. and E. Kowalzig, M.D. Translated by L. H. Grau, Ph. D. and W. N. Sullivan, M.D. Edited by NICHOLAS SENN, M.D. Sq. Svo, pp. xl, 866, New York, The Macmillan Co., 1901.

Practical Surgery: A Work for the General Practitioner. By NICHOLAS SENN, M.D., PH.D., LL.D. Svo, pp. 1133, with 650 illustrations, many in colors. Philadelphia and London: W. B. Saunders & Co., 1901.

works that it is worth while strongly to emphasize it. The faculty of clear statement is not the property of every author, and the fuller the discussion of a subject the more nebulous the effect upon the mind of the reader. The presentation of an accurate analysis and resumé of every subject considered then is well nigh a necessity to the completeness of any medical and surgical treatise. The law schools have a series known as the "Hornbook Series," in which this feature is brought out with particular strength, resulting in a popularity and usefulness hitherto unprecedented in such text books. While entirely differentiated from the "Hornbook" style, the epigrammatic and comprehensive character of Colonel Senn's diction accomplishes the same purpose. The book has kept well abreast of the progress of surgery, which has latterly been so striking in this department of the art,—a fact which has necessitated the addition of a hundred pages of text, the re-writing of much of the contents of former editions, the re-drawing of many of the old cuts and the addition of over a hundred and fifty new illustrations. Two new chapters are added, on "Regeneration" and on "Blastomyecetic Dermatitis" respectively, rounding out to completion a work which will long live as a monument to the didactic genius manifest in the author's utterances.

Professor Esmarch's prize essay on the Treatment of the Wounded in War, better known as the Surgeon's Handbook,—of which the first edition with fine colored plates was translated into English by Mr. H. H. Clutton, of London and the third edition was translated by Dr. B. Farquhar Curtis of New York,—has been a standard of reference for the military surgeon for twenty-five years. Its motto *kurtz und bündig*—brief and concise—was appropriate, but the portly volume to which it is now expanded, under the English title of *Surgical Technic*, seems rather less fitting. It is still *bündig*, but it requires a vast stretch of the imagination to consider it *kurtz*. The first edition consisted of two parts, the dressing of wounds and operations; the present is divided into twenty-one parts, the treatment of wounds, bandaging, narcosis, simple oper-

ations, operations on the nerves, skin and bones, amputations and disarticulations in general and of the upper and lower extremities, resection of joints and of the upper and lower extremities, operations on the head, plastic operations for fissure of the oval regions, and operations upon the facial cavities, the neck, the breast, the abdomen, and the pelvis, from which it appears that the original essay on the treatment of the wounded in war has developed into a complete treatise on operative surgery, including not only accident surgery but all other phases of operative work. The German work of General von Esmarch left little to be desired but that little has been supplied by Colonel Senn in the American edition. It should be a part of the field surgical equipment of every military command. The shape particularly adapts the book to ready consultation and its broad pages easily lie open. For field service, however, the half morocco binding should be used, the cloth cover not being strong enough to stand the strain of active service.

In his *Practical Surgery*, we have Colonel's Senn's most important contribution to science and it is of particular interest to military surgeons, not only because of the teachings based upon the author's experience in the Illinois and Wisconsin National Guards, his observations in the Greco-Turkish war and his active service in the Spanish-American campaign, but because of the great interest which he has continued to manifest in medico-military affairs for many years. So, in the book now under consideration, while the entire text is worthy of careful and detailed examination, the references to the military side of surgical practice will naturally be of especial interest. The demands upon the military surgeon by the exacting and often onerous duties incumbent upon him in time of war are so succinctly and picturesquely stated that the temptation to quote them *au large* is not to be resisted. Colonel Senn believes that he must be "not only well versed in theoretical and practical knowledge of every thing pertaining to the practice of medicine and surgery, but he must be endowed with qualities

both of mind and body upon which he can rely when engaged under the most trying circumstances. In field work, he has often to perform the most difficult tasks with very limited resources. In such instances good common sense and deliberate action go much further in accomplishing what is desired than the finest scholarship and the most profound logical reasoning. The man who can in a few moments extemporize a well-fitting splint out of the simplest materials, and perform with the contents of the ordinary pocket-case the most difficult operation, will do vastly better work on the battlefield than most professors of surgery and the most brilliant operators in civil practice. The surgeon who understands the principles and practice of cooking is of more service to the troops than the one who can repeat word for word, the contents of the most exhaustive treatise on *materia medica* and therapeutics. The medical officer with a full knowledge of hygiene and sanitation and endowed with the faculty of making a rational practical use of it, is preferable to the most expert clinician, as in military practice, it is more important to prevent than to treat disease, no matter how successfully and scientifically the latter may be conducted. The all-round medical officer must be a good mechanic; he should know how to use the carpenter's and blacksmith's tools, how to row and sail a boat, how to make a raft, and occasionally he will have reason to be thankful if he has learned how to pack a mule and drive an ambulance team. His miscellaneous knowledge of matters and things entirely outside of his legitimate province will be constantly drawn upon from different sources, and the more he knows and is willing to impart, the more he will be useful and popular. The man who enters the medical department of the army under an impression that he is only expected to treat wounds, set broken bones, and prescribe for the ordinary camp ailments makes a serious mistake and will surely be a disappointment to himself and to those he is expected to serve *

* * * The military surgeon must be a man of vigor, made so by birth and training, with as few requirements in his habits of living as possible, in order that he may resist to

the highest degree the influences of climate and disease, and prepare himself for the hardships and privations incident to active warfare * * * The medical education of a military surgeon must be of the most liberal and broadest kind. His practice is so varied that he may have to be physician, surgeon, oculist, aurist, etc., the same day. The sphere of the regular army surgeon serving at a post includes in addition obstetrics, gynecology and diseases of children. Every military surgeon must be an expert in physical diagnosis and examination of the eye and ear. He must know something about dentistry; he must know how to extract teeth and how to put a temporary filling in a carious tooth that can be saved. He must be familiar with neurology, the use and application of electricity as a diagnostic and therapeutic resource. *

* * * He must be able to apply and make use of his knowledge. * * * Quick decision and prompt action are the essential prerequisites of successful emergency work. Successful action however must be preceded by thoughtful systematic preparation. * * * * * The nation worships the heroism of those who fell before Santiago, but much less is said of the vastly greater number stricken down by disease, and who have lost their lives from disease, often after prolonged and intense suffering. To the credit of the medical officers of this and other wars it must be said that they showed no fear, either in facing the enemy or, what is vastly worse, disease. When yellow fever made its appearance among the troops around Santiago, every man remained at his post and faced the danger without flinching. Men from the North who had never seen the disease, accepted the detail for duty in the fever hospitals without a word of complaint. The medical officer must be endowed with more than ordinary courage to face the many dangers that surround him on all sides during a campaign. * * * * * It is in war that his ready resources will come to the surface and will be subjected to the severest tests. It is in battle and during the prevalence of devastating diseases that his moral courage and physical endurance will be most severely tried. It is under such circumstances that the troops will reap the greatest bene-

fits from the skill, diligence, fortitude and ready resources of the medical officer."

The chapter upon Gunshot wounds is based upon the lessons of the most recent hostilities. "The evil of meddlesome surgery became very apparent during the brief Cuban campaign, and it has taught us an important lesson that must be heeded in the future. * * * Every change in dressing, more especially in military practice, is attended by risk of infection and must be scrupulously avoided, unless local or general symptoms indicate the existence of complications that demand surgical intervention." With this view of the first dressing, it naturally follows that the author is an earnest advocate of the first aid package, and considerable space is devoted to the discussion of the composition and application of this dressing; he considers the first aid package, of which more than a quarter of a million were distributed to the American troops in the Spanish-American war, to be too bulky and advocates the substitution of his own package, consisting of an antiseptic powder (such as borosalicylic powder), two squares of aseptic lint 4x8 in., a gauze handkerchief 40 inches square, sterilized pins wrapped in tin-foil, and, between this package and the outside impermeable cover, two strips of adhesive plaster, 1 inch wide and 8 inches long. As would be expected from his opinion of the importance of ability to extemporize in a surgeon, he dwells freely upon extemporized methods of dressing, splints, and arterial compression, but by no means to the neglect of the more refined methods. As would be expected, Colonel Senn objects to the use of the bullet probe except in very exceptional cases. He regards the fluoroscope favorably, however, and considers the x-ray an indispensable diagnostic resource to the military surgeon in active service, suggesting that every chief surgeon of an army corps be supplied with a portable apparatus and an expert to use it. He believes that, with the small-calibre bullet "(1) fewer bullets will be found lodged in the body, (2) wounds will resemble more closely incised than contused wounds, (3) range will have more influence in changing the character of the

wound, (4) risk of infection will be diminished, (5) dangerous primary hemorrhage will be more, secondary hemorrhage less, frequent, and (6) the extraction of the bullet will be more difficult."

"The sanguine expectations," he believes, "as to the benefits to be derived from laparotomy on the battlefield have not been realized after ample experience. The only place where such an operation in well-selected cases is advisable and expedient is in the field hospital." The subject of gunshot wounds is further taken up topographically and thoroughly discussed in the light of the latest observations.

His teachings on abdominal and intestinal surgery are so well known that it is sufficient to remark that the statements of the present work are in line with the already well-known views of its distinguished author. Many other features of the book demand mention, for the work is a materialization of the author's own personality. As was said of the *Petit Chirurgie* of Pierre Franco, "it is the author himself, his thoughts, his experience," and as such, it right worthily commands the attention of his compeers. JAMES EVELYN PILCHER.

THE INTERNATIONAL TEXT BOOK OF SURGERY.

THE two handsome volumes of the Warren-Gould International Textbook of Surgery* are up to date and devoid of verbiage. The unusually high standing of the contributors promised a work of more than ordinary merit, and the expectations are well fulfilled. The articles by Bull, Deaver, Pilcher, Tuholske, Willard, Fowler, DaCosta, Warbasse and McBurney are all worthy of mention, but we are particularly interested in the articles pertaining to military and naval surgery.

The excellent outline of the principles of military surgery by Colonel William H. Forwood of the army, after a review of

*International Text Book of Surgery, by American and British Authors Vols. I, II; pp. 947, 1072. Edited by J. Collins Warren, M.D., L.L.D., and A. Pearce Gould, M.D., F.R.C.S. Philadelphia, W. B. Saunders & Co., 1900.

the subject of projectiles, which includes five interesting tables and several plain and well executed illustrations, the writer vividly describes the conditions of a modern field of battle. After an experience covering more than forty years of active service he says, "Conservative surgery on this part of the field should be a cardinal rule", and "Laparotomy at the ambulance stations will hardly be practicable, or even justifiable," giving as the main reason the often forgotten fact that "such cases require complete rest after operation, which they cannot have on the field." The few pages allotted to the subject of Military Sanitary Organization should be read by every member of the Association. From them one can obtain a non-technical, graphic and authoritative outline of the actual conditions in war, and of the necessity of the three cardinal points—preparation, organization and administration. The value of a study of past campaigns, battles, of terrain, transportation, weather, tactics and the organization and work of other departments is dwelt upon, while under the caption of Service of the Medical Department in the Field is a detailed and vivid picture of march and battle. Space forbids long extracts but the following seems especially pertinent: "Those who expect to go upon the field and pitch their hospital tents in the rear of each brigade and division during a battle will be able to learn much from the study of past campaigns," * * * * "The object of first importance is success in battle. The surgeons, at least two to each regiment and one to a battery, should proceed with the command," and "in some armies one surgeon to each regiment must remain for moral effect with the men under fire." The article closes with a recommendation of a uniform system of identification by means of a small metallic tag, the adoption of which sensible idea would not only identify the dead, but would render valuable assistance to the regimental surgeons in reporting casualties after a fight.

The scholarly article on Naval Surgery by the late Dr. Charles A. Siegfried well illustrates the radical difference between the conditions of the two services. Not only are the

diseases and injuries unlike, but the time of the naval officer is free for work in the line of his professional training, as his manifold duties all bear upon sanitation and the treatment of wounds and disease. The responsibilities of command, of divers property interests, and of the larger administrative positions which prove so important in the military branch, are much less onerous in the navy. The wounds in the latter service are usually made by heavy ordnance, while the interesting table of Colonel Forwood shows that nine out of ten wounds in the army are due to the fire from small arms. The obstacles to the prompt transportation of the wounded aboard ship during action seem almost insurmountable, though twelve per cent of the command are drilled as bearers.

From the nature of the service, a distinction between combatants and non-combatants in a naval battle seems preposterous, and this is the ground taken by the author who makes the point that the so-called non-combatant force below decks is not only exposed with that above to disaster from the enemy's projectiles, but must also face the dangers incident to scalding steam, the ammunition and the various engines of the ship.

The subject of obligatory operation is of interest, and the army rule that a man must submit to minor operations not involving life or limb, when the object is his restoration to duty, should be extended to include the radical cure of hernia.

All military surgeons meet on a common ground when the subject of Hospital Ships is discussed, and the short description of the "Solace" is very interesting. The Relief, Solace, Bay State, and Missouri all proved their *raison d'être* during the war with Spain and it is regretted that we have no hospital ship in our service especially designed and built for that purpose.

The statement that half the naval surgeon's work in some parts of the world is due to venereal disease shows the importance of common sense work for its prevention, and the criticism of an "unwillingness to restrict crews" does not seem well grounded. A thorough and practical weeding out of in-

fected females, and a constant supervision rather than an attempt at repression would rob "some parts of the world" of many of their dangers. The remarks of Colonel Greenleaf at Buffalo anent the far reaching results of these diseases are well worth careful perusal, and the usual policy of ignoring the existence of the cause of the disease is little short of criminal. Dr. Siegfried's whole article is valuable and very interesting.

JOHN STEWART KULP.

FIRST AID IN ILLNESS AND INJURY.*

MAJOR PILCHER'S work on "First Aid," needs no introduction to military surgeons. It has been in general use in the army for a decade, contributing very largely to the high class of work done by the army hospital corps. Immediately upon its publication ten years ago, it was naturally accorded the highest position among works of its class, and, in the successive editions which have followed, it has easily maintained its leadership. And now this seventh edition comes still further improved by additions derived from the practical experience gained in actual warfare during the past three years. At the same time the size of the volume is kept down so that it can be carried in the coat pocket and with its neat green leather binding embellished with the red cross of the Geneva convention it presents a very artistic appearance.

The scope of the work is to provide systematic instruction for the Hospital Corps of the Army and others who may be called upon to care for the wounded or meet medical or surgical emergencies. Part I, under the title of the "Human Machine," gives briefly the general principles of anatomy and physiology, devoting special attention to the

**First Aid in Illness and Injury* comprised in a series of chapters on the human machine, its structure, its implements of repair, and the accidents and emergencies to which it is liable. By JAMES EVELYN PILCHER, M.D., Ph.D., Major and Brigade Surgeon of United States Volunteers, Captain in the Medical Department of the United States Army. *Seventh edition revised.* 12 mo. 322 pages, 175 illustrations. New York, Charles Scribner's Sons, 1901.

course of the large vessels and the location of the viscera. Part II entitled " Implements of Repair," speaks of the bacteria and the methods of fighting them; and goes into details about bandaging, splints, slings, and especially the first aid packet and the method of using it.

Part III, " Emergencies and Accidents," which forms the chief portion of the work, deals with accidents and injuries, and includes wounds, hemorrhage, fractures, drowning, freezing, poisons, snake bites, and in fact a complete list of the accidents met with even in time of war. It is needless to say that this part of the work is characterized by accuracy and good sense and is free from the errors so common in works of this kind. In the treatment of hemorrhage, for example, the tourniquet is put in the background and special stress both by text and illustrations is put upon the elevated position of the limb and direct pressure over or into the wound. Methods of handling and transporting the wounded and litter drill for the hospital corps are included in this part.

Part IV, " the Care of the Human Machine," gives directions for the soldier in taking care of himself, and includes directions about food, drink, clothing and cleanliness.

While the work is primarily designed for the instruction of the military service, it is exceedingly well adapted for a much broader field, that of disseminating knowledge along these lines among the laity and is especially useful for those whose vocation renders them liable to be called upon to render assistance in machinery accidents, wrecks, drowning, sun stroke or poisoning.

In the work of the hospital corps of the army, navy or national guard it is absolutely indispensable. No course of instruction is complete without it, and we heartily congratulate the author and publishers upon the general recognition of the fact shown by the call for so many rapidly succeeding editions.

GEORGE REEVES WHITE.

A NEW FRENCH MEDICO-MILITARY JOURNAL.*

OUR new French contemporary shows so much enterprise and originality that we predict for it a prosperous future. The editorial announcement of the first number is as follows:

"Now-a-days when all civilian physicians are connected with the corps of military sanitation, when reserve surgeons are individually striving to familiarize themselves with the special practice which awaits them in case of war, many people of good judgment believe that a journal which would popularize the work of military surgeons and physicians of different countries, could not only be successfully published but would also become a necessity.

"Our old comrades, and several of our professors, led doubtless by the individuality of our specialty, have persuaded us to this enterprise by promising us not only their support, but their most devoted aid.

"Under such circumstances the decision was easily made and we are today presenting the medical public with *Le Caducée*; a journal of army surgery and medicine. The design, and the path we shall follow are outlined in the ensuing prospectus, which will be faithfully carried out.

"Army surgery and medicine are ruled by principles, which are just as binding on military surgeons, as are those which govern the navy or the colonial service, and this is true of both the active list and the reserve. For the furtherance of scientific unity a publication which will bring together the work of military surgeons—army, navy and colonial service—both of France and foreign countries, will answer a real necessity and this is the aim of *Le Caducée*.

"The name itself calling up as it does the most ancient symbol of medicine, and also the insignia adopted by military surgeons, is a guarantee of fraternal union, of scientific tradition.

La Caducée far from competing with its elders, the official publications, proposes only to bring out the wealth which is now accumulating out of the sight of the medical public. It will not be a rival but an ally, and in some respects a supplement.

**Le Caducée, Journal de Chirurgie et de Médecine d'Armée, Guerre-Marine-Colonies.* Rédacteur en chef, M. le Dr. GRANJUX. Secrétaire de la Rédaction, M. le Dr. ED. LAVAL. M. Léon, 9 Rue Jacob, Paris.

"We may add that we shall treat scientific subjects only. No criticism of military authorities will be made, nor will personalities be permitted. On the other hand our columns are open to all workers in the military field.

"Our program therefore being definitely outlined, here is what we expect to realize: *Le Caducée* will be published every fifteen days, the first and third Saturdays of the month. It will contain original articles, general reviews, a synopsis of the French and foreign press, medico-surgical studies of war, and finally a special bibliography of news. This is a large program but we shall undertake it fearlessly, trusting to the friendly support, in France and foreign countries, of the men who do honor to military surgery and medicine."

Le Caducée is a 16-page paper, 24x32 cm., four pages of which are devoted to advertisements. The later numbers are well up to the standard of the first, some of the photographic reproductions being especially good, and we are glad to welcome it as a co-worker in our own field. JOHN STEWART KULP.

NEW BOOKS ON FIRST AID.*

THE growing importance of the study of first aid is indicated by the increasing number of manuals for the enlightenment of students of the subject. The two latest come to us from England, and are excellent examples of the two types of such works,—the complete text book and the concise manual. There is much that is admirable in the little isogogue of Drinkwater, the illustrations being particularly good and mainly half tones from photographs. He gives a new diagram of the circulation which is particularly good. The instructions are clearly couched in pleasant conversational phraseology and are clearly and attractively expressed. The chapter on transportation is weak, however, and omits

**First Aid to the Injured and Ambulance Drill.* By H. DRINKWATER, M.D., 24 mo. pp. 104. 74 illustrations. London, J. M. Dent & Co., 1901.

First Aid to the Injured and Sick. By F. J. WARWICK, B. A., M. B. Cantab., Surgeon-Captain, Volunteer Medical Staff Corps, and A. C. Tunstall, M. D., F. R. C. S. Ed., Surgeon-Captain Commanding the East London Volunteer Brigade Bearer Company. 16 mo. 232 pages. 154 illustrations. Philadelphia and London: W. B. Saunders & Co., 1901.

some of the most desirable methods, while including others that would be of more advantage were they absent.

The work of Warwick and Tunstall is more pretentious and presents the subject in two parts, one of 64 pages,—consisting of an outline of human anatomy and physiology.—the other of 142 pages,—containing the practical applications of first aid. The former section is rather more elaborate than is desired by most students, although not too much for others. This would have been well expressed, had the more essential facts been stated in one size of type and the more detailed information in another. Many new cuts add much to the excellent qualities of this section. The second part contains an exceedingly full and exhaustive discussion of bandaging and a complete and comprehensive treatment of hemorrhage, while fractures are amply considered pathologically as well as therapeutically. The tabular form of treating of hemorrhage, poisoning and bandaging is adopted with excellent effect, rendering reference easy on the part of the student. Transportation is minutely discussed but is rather out of date from the American standpoint, although the methods of carrying the injured are, as in Dr. Drinkwater's manual, feasible and useful. The methods of using the litter are those of the British army. The small print of the work renders it possible to compress a large amount of information within its very handsome covers, although it is attended by the resultant disadvantage of making it a little difficult to read. The book is a distinct advance on former candidates for the favor of British ambulance classes and is worthy of wide circulation.

JAMES EVELYN PILCHER.

NEW CONTRIBUTIONS TO THE LITERATURE OF FRACTURES.

SINCE the publication of Samuel D. Gross' work on the Anatomy, Physiology and Diseases of the Bones and Joints in 1830, numerous books upon fractures have accumulated to the credit of American Surgery. The recent treat-

ises of Scudder and of Beck worthily find a place among the most valuable of the collection.

The most pleasant task the writer has undertaken for a long time, is that of reviewing the admirable text of Scudder.* As a general practitioner he has seriously felt the need of such a volume as a reference many times in the past. Every page is replete with information, valuable alike to the beginner, and to the experienced surgeon. The author has illustrated the text with numerous X-ray tracings showing the actual condition of the fractured bones and their relations to the surrounding soft parts. The information thus derived is applied in a scientific manner, and the treatment of many fractures greatly simplified. Many of the 608 illustrations are devoted to showing the best method of examination for the detection of the fracture, and how to apply the required dressings. A special feature is the statement of indications for operative interference, given under the appropriate heading in each case where it may be required.

While all parts of the book are equally meritorious, special attention is called to the following group of fractures. The subject of fracture of the skull is dealt with in a masterly manner and includes a description of the method by which they are produced, the special symptoms that may develop, the complications and sequelae that may ensue, and the indications for operative treatment in each case in detail; at the end of the chapter illustrative cases are given. In connection with fractures of the vertebrae the lesions following injury to specific vertebrae are presented in detail, and are shown by diagrams, as are also the lesions produced in the cord by the injury. In discussing the pelvis, lesions of the abdominal viscera, as well as the urethra and bladder receive attention and the necessary operations are considered.

Fractures of the humerus are delineated with particular clearness by the X-ray tracings, in different positions, and

**The Treatment of Fractures.* By CHAS. L. SCUDDER, M. D., Assistant in Clinical and Operative Surgery, Harvard Medical School. *Second edition, revised and enlarged.* Roy 80 p.p. 433, 608 illustrations. Philadelphia and London: W. B. SAUNDERS & CO., 1901.

the means by which they are produced illustrated. Special attention is given to the treatment of solutions of continuity near the elbow, with and without splints, and careful instructions how to preserve the carrying angle and the function of flexion are not wanting.

Colles' fracture with its anatomy and differential diagnosis receives very careful consideration. Illustrations of the deformity are given, X-ray tracings of the different forms of the fracture are used as well as skiagraphs to elucidate the text. The author, however, fails to recognize the essential pathological element in the displacement of fracture of the lower end of the radius, as classically demonstrated in Vol. VII of the Proceedings of this Association. The methods used to reduce the fracture are shown and attention directed to special points in the illustrations to facilitate reduction, while attention is directed to the methods of treatment required by the various forms of the lesion in the illustrations together with the manner of application. The chapter on fracture of the hip and femur is very interesting and contains much that is new and valuable; special attention is called to treatment of fracture of the femur in children.

In connection with treatment of fractures of the patella, after describing the relative dressings it is advised that operation should be undertaken only by surgeons of judgment and great skill, who have at command skilled assistants, and who can work under the most rigid aseptic conditions. A chapter, devoted to plaster of paris dressings, consists mostly of illustrations. The book concludes with a chapter upon the ambulatory treatment of fractures in which the arguments for and against this method are carefully considered.

The discovery of the Röntgen rays has contributed to the treatment of fractures an impetus almost impossible for the student of the last few years to realize. A comparison of the interesting work of Dr. Beck* with one published prior to the discovery of the X-ray is like comparing the achieve-

**Fractures.* By CARL BECK, M.D., with an appendix on the practical use of the Röntgen rays. roy 8° pp. 335. 178 illustrations. Philadelphia, W. B. Saunders & Company, 1901.

ments of ancient and modern history. As an exponent of the use of the X-ray in the treatment of fractures this work is an admirable guide. The majority of the illustrations are from skiagraphic plates of the different bones at the point of fracture illustrating the deformity existing. The contents are condensed under: an introduction; fractures in general; fractures of special regions; and the appendix.

The introduction is devoted to the consideration of the different facts in electricity leading up to the discovery of the Röntgen rays and "the special uses of the rays in diagnosing the various types of fractures." Under fractures in general, the classification, symptoms, diagnosis, the process and the disturbance of the process of repair, and treatment in general are considered. A feature of the book that seems superfluous, and that might be well omitted, is the details on aseptic surgery. This is treated fully in all modern textbooks of surgery, and especially in the author's manual on Asepsis. The author's treatment by moss splints is described in connection with fractures of the clavicle and compound fractures and its desirability urged. The book is a valuable acquisition to the scientific consideration of fractures, and the many points of excellence will well repay the reader for a careful and detailed perusal.

A. R. ALLEN.

SOME IMPORTANT MEDICO-MILITARY PAMPHLETS

IN ADDITION to the annual reports of the Surgeon Generals of the various services and the reprints of memoirs which have appeared in the JOURNAL, a number of pamphlets* of medico-military interest have recently been issued from the press. Among these should be mentioned, as especially worthy of notice, the instructive papers of Colonel Alden upon the climate and diseases of Porto Rico and the personal identification system with which he has been so intimately associated during his prolonged tour of duty at the War De-

*Colonel Charles H. Alden, U.S. Army, Puerto Rico; its climate and its diseases. 12 mo. pp. 20.

Ibid. The U. S. Army System of Personal Identification. 12 mo. pp. 18.

Major Angel de Larra y Cerezo, *Les services sanitaires d'Espagne en Afrique.* 12 mo. pp. 13.

Ibid. The Official Hygienic and Sanitary Institutions in Spain. 8vo. pp. 6.

Rear Admiral Presley M. Rixey, Medical and Surgical Report of the Case of the late President of the United States, 8vo. pp. 24.

partment. A couple of papers by the distinguished editor of *La Medicina Militar Española* upon Spanish sanitary organization at home and in Africa are most valuable, and will be treated in abstract hereafter. The detailed report of the case of the late President McKinley, by Admiral Rixey, who was his attending physician, is a model report of a case, which, because of the high station of its subject will always command attention and which will happily always be free from criticism of inadequate scientific description. JAMES EVELYN PILCHER.

THE REJUVENATION OF HEATH.

HEATH'S Minor Surgery* has held the favorable regard of the profession for so many years that a new edition, modified in accordance with the advances made in surgery during recent times, comes with pleasurable emotions to the attention of the medical officer of the *commencement de siècle*. In its earlier days, occupying a place upon the army Supply Table, it has been of exceeding service in the training of a host of young military surgeons. The present edition, unavoidably somewhat larger than earlier ones, is still judiciously condensed into convenient limits and the revisions and additions of Mr. Pollard have been made with marked judgment and discrimination. The chapter on Bandaging is selective rather than comprehensive in character, many forms of bandaging ordinarily described being omitted; it seems odd, for example, to a military surgeon to find no full description of the triangular bandage and its multiple applications. The first aid dressing packet, so important an adjunct to the work of the military medical officer, is also conspicuous by its absence. Sterilization and the manner of attaining and maintaining asepsis by modern methods receive ample attention, anaesthesia is considered in the light of the most approved practice, the minor operations are instructively described, and the book is so brought up to date as to amply continue its work of prompting and befriending successive generations of surgical youth. JAMES EVELYN PILCHER.

*A Manual of Minor Surgery and Bandaging. For the use of House Surgeons, Dressers and Junior Practitioners. By CHRISTOPHER HEATH, F.R.C.S., LL.D. Twelfth edition. Revised by BILTON POLLARD, F.R.C.S. 12 mo, pp. 426, 195 illustrations. Philadelphia, P. Blakiston's Son & Co., 1901.

A BRIEF SKETCH OF THE ORIGIN AND HISTORY OF THE MEDICAL CORPS OF THE UNITED STATES NAVY.

By CAPTAIN GEORGE PERLEY BRADLEY,

MEDICAL DIRECTOR, UNITED STATES NAVY.

IT IS the purpose of this paper to sketch, as briefly as the time and space allotted demand, the history of the origin and development of the Medical Corps of the United States Navy; to trace its slow and gradual progress from a few surgeons and surgeon's mates, employed like other officers only on such armed vessels as could be hastily collected, for strictly professional duties afloat, and discharged when their ships were out of commission, to the present thoroughly organized and equipped body, with a centralized administration, controlled as far as the general discipline of the Navy permits, by a senior member of its own force, and with functions embracing every portion of the healing art. The requirements of this art, constantly enlarging, must be met and complied with in military service, often at a great disadvantage; for, whereas the tendency in the profession at large, with the increasing number of branches correlative with the practice of medicine and surgery, is towards specialism and division of work, the military or naval surgeon is obliged to have at least a respectable working knowledge of all; must be his own hygienic expert, analyst, bacteriologist, etc., besides being what is commonly termed a general practitioner in the largest sense of that term. Very many of these branches were unthought of even a generation or two ago, and though it has long been recognized that the most really important practical duties of a naval medical officer are those tending to the prevention of disease rather than to its treatment, i. e. hygiene

and sanitation, yet this elementary notion has needed a long time and many efforts to secure practical adoption and enforcement, while the details making up these sciences are constantly changing and advancing.

The Country Doctor ("clarum et venerabile nomen") was not so often thrown upon his own resources under unfavorable conditions as was the naval surgeon, even in former times, when the scope and range of the duties of the practitioner were so much more limited. Especially, he was less often called on to judge and decide, sometimes very quickly, questions which involved the fate of a large ship's company by the entrance or non-entrance of an infectious disease. These matters are adverted to but briefly in this introduction, to point out the extreme importance of that settled centralized organization now to a great extent at least secured and confirmed by law, almost unknown in the earlier years of the Corps, without which, and the discipline necessarily attendant, the accomplishment of the manifold duties of a medical officer, particularly at sea, from being merely difficult would become impossible. It may also be noted here that the increased time now needed for a young man to acquire the rudiments of a modern professional education is recognized by an increase of the age limit of candidates to thirty years instead of the twenty-six formerly prescribed—a benefit not only to the candidate but to the corps and to the service of the country which is always to be primarily considered.

To trace the successive steps by which this present organization was legally secured will be the main purpose of this sketch, with some reference to the writings and efforts of the men who aided therein, or who otherwise have done honor to their corps and profession by services in war and in peace, oftentimes, as will be seen, "no less renowned" by unselfish heroism and daring in the latter than in the former.

In the first period of our history, from the beginning of the Revolution to 1789, there is even less to be found (on any superficial examination) relating to medical officers than might be supposed. Indeed one may look through most of the standard

works on naval history anywhere at a later date, and find no more reference to such officers than as if they had been non-existent. But in fact there is little, save descriptions of bloody actions at sea, and their dates, in most of them: how the ships were equipped (save as to battery); what, if any, precautions were used to preserve the men in health; the diet; the many things which contribute to enabling one vessel to keep the sea, and to forcing another to struggle into port unfit for service, were not usually regarded as in keeping with the "dignity of history." Yet it is apparent that even then, or at any rate a few years later, some commanders like Decatur, Rodgers, and David Porter (of "Essex" fame) appreciated the bearing of such questions and used all efforts to settle them. In the earlier days almost every armed vessel, even pirates, had a surgeon of some kind, and with the first ships commissioned by the Continental Congress provision was made for surgeons and their mates, in number according to the number and size of the vessels.

The first order looking to the establishment of a national Navy was given by General Washington in the latter part of 1775, when he commissioned Captain Nicholson Broughton with two armed schooners belonging to the colony of Massachusetts, for the special service of capturing certain vessels containing supplies of war. Captain Broughton brought in ten prizes, (though not those desired).

The first real naval armament ordered by the Continental Congress, in October 1775, comprised a number of small armed vessels, which performed the first service under strictly national authority. By the end of that year (December 13, 1775), thirteen vessels of war had been authorized, apportioned to the colonies of New Hampshire, Massachusetts, Connecticut, Rhode Island, New York, Pennsylvania, and Maryland. Rules and regulations of the Navy had already (November 28, 1775) been enacted, and these, adopted with their modifications and approved in 1800, form the basis of the present "Articles." Surgeons and surgeon's mates, the former commissioned officers, the latter warranted, were specified in cer-

tain fixed number to each vessel, and (Act of January 6, 1776) their shares of prize money were allotted. The importance of prize money at this period will be apparent by reference to the earliest pay-tables, where the pay of the surgeon of a small vessel (under 20 guns) was the magnificent sum of \$21 $\frac{1}{3}$ per month; of the larger class \$25.00; of their mates \$13 $\frac{1}{3}$ and \$15.00 respectively. This was not disproportionate to the pay of other officers, and it is evident that the emolument of all was dependent on the plunder rather than on the stipend, as may be inferred by the very careful allotment of the former prescribed in various acts of Congress from the earliest times up to very recently, when prize money was finally abolished, subsequent to the war with Spain. There was also a bounty (by act of November 15, 1776) of \$20.00 per gun of prizes, and of \$8.00 per man of the hostile force, to be distributed in the same ratio with prize money.

It is a pity that the medical officers of the Navy did not possess, then or subsequently, a Smollett, who could have bequeathed to us such a word-painting of the American ship as did the great English author of his own vessel; it would be interesting to note how far, if at all, there had been an advance made from the absolute barbarism of 1730 to 1780; if we may judge by the very slow improvement from the latter period up to 1850, when flogging was forbidden, and to 1862, when the grog ration was abolished, there must have been little of civilization. But we are not able to trace more than a few facts in regard to our medical ancestors of the Revolutionary Navy. It would appear that surgeons and their mates were at first employed like other officers, in definite number, for service on such vessels as could be fitted out, with commission or warrant from the "Marine Committee" or their substitutes, and simply for the purpose of attending to the wounded and sick; that when the ship was laid up or destroyed, their employment ceased. Cooper, in his "Naval History" remarks of the Revolutionary Navy, "After the first effort connected with its creation, the business of repairing losses, of increasing the force, and of perfecting that which

had been so hastily commenced, however, was either totally neglected or carried on in a manner so desultory and inefficient as soon to leave very little of method or order in the Marine. As a consequence officers were constantly compelled to seek employment in private armed ships, or to remain idle," etc. It would be difficult, if not impossible, even to approximate the number of medical officers employed in any one year, depending as it did on that of vessels actually in service.

In 1777 an act was passed prescribing that no surgeon or mate could be commissioned or warranted without a favorable certificate of examination from at least one examiner appointed for this purpose, indicating that even this qualification had not been necessary before. The pay and allowances of surgeons were also equalized with those of lieutenants according to the class of ships on which they were serving. (\$25.00 instead of \$21½, etc.).

The only provision for shore pay or subsistence appears in an act of 1775, allowing all officers \$4.00 a week for "board" when their ships were not in a state to receive them.

At the close of the Revolutionary War, and indeed for several years subsequent to 1789, there was no Navy. The last vessel remaining, the "Alliance," had been sold in 1785, and though in 1789 the President was declared commander-in-chief of the Army and Navy, with power of appointment of officers, subject to confirmation subsequently by the Senate, no steps were taken to acquire vessels till 1794, when the Algerine piracies caused the passage of an act authorizing the provision of four vessels of 44 guns and two of 36 guns, with specific allowance of officers and men to each. The former class were entitled to one surgeon and two mates, the latter to one surgeon and one mate. It also fixed the pay of these officers at \$50 and \$30 per month respectively, and two rations (of about twenty cents each) per diem. It also prescribed the ration itself. Although this act was for a temporary purpose and soon became obsolete by the cessation of hostilities, it laid the foundation of the present Navy, and for many years its provisions were unchanged. Pay and rations of medical

officers remained unchanged until 1828. A similar act specifying the three frigates "Constitution," "Constellation," and "United States" for service was passed in 1797, with a section prescribing that officers and men should be governed by the rules of November 28, 1775 "so far as the same may be applicable to the constitution and laws of the United States," and, as already stated, these were practically adopted in the act of April 1800. This act also was limited to a year's duration; but in 1798, April 30, the Navy was finally established on a more permanent basis by the creation of the office of Secretary of the Navy, the Secretary of War having hitherto administered the duties. As regards the Medical Corps, surgeon's mates are now commissioned; there had been no change in the nature or scope of their duties, nor was there for some years, but at least they were regularly and to some extent permanently employed, they were protected by a commission at entrance, and before many years the increasing needs of the regular naval establishment and increasing scientific knowledge were to lead to the formation of a hospital system, a system of physical examination of recruits, allowance tables and other details necessary to an organized service. The number of medical officers varied according to the supposed exigencies of the moment. After the termination of the French hostilities various acts of Congress, beginning with 1801 and modified or amended during the next few years, provided for a "Naval Peace Establishment." The first, (March 3, 1801) ordered the sale of all vessels except thirteen, specified by name, of which six were to be kept officered and manned (with a reduced complement of seamen), the remainder to be laid up with a small detail to care for them. The President was authorized to discharge all officers except a certain number specified by name, of Captains, Lieutenants and Midshipmen. Of officers he thought proper to retain, only those actively employed were on full pay; the rest were on half pay only, as was then and long afterwards customary. In the absence of any lists, excepting those of the commissioned line officers, we can only conjecture that the surgeons and

mates were proportionately affected with them; but it is plain that the reduction was not so great as has been generally supposed, and the ensuing war with Tripoli which continued four years, must have secured employment to many if not most of the existing number. It may be of interest to mention that three medical officers were captured in the "Philadelphia" in 1802, and that one (Dr. Herman) shared in the dangers of Decatur's exploit, on the ketch "Intrepid," when that frigate was destroyed, February 16, 1804.

The history of the Naval Hospitals of the United States, the first "shore duty" of the Corps, is rather curious. Prior to 1811 (act of February 26) there was no attempt to establish them as separate institutions: in 1798 (act of July 16) marine hospitals for the merchant navy had been so established, and the sum of twenty cents per month was deducted from the wages of the seamen. The next year this act was so amended as to apply to the Navy, the same deduction from the pay of "officers, seamen and marines" authorized, to be paid quarterly to the Secretary of the Treasury, and the same "benefits and advantages" of the hospitals to accrue to them as to the merchant sailors. The inconveniences of this divided control might have been foreseen. In 1810 (February 22) Secretary of the Navy Paul Hamilton, in a letter to the chairman of the House Naval Committee, states: "The amount thus deducted [i. e. the twenty cents per month] paid into the Treasury, is \$55,649.27, and there is a considerable sum deducted but not yet paid into the Treasury: and yet no Navy officer and but very few of the Navy seamen have received any benefit from it. * * * * * The inconveniences and embarrassments which arise from the placing of persons engaged under military laws in the public service in hospitals where no such laws exist have escaped the attention of Congress.

"In the few cases which have existed of any seamen being sent to such hospitals, experience has proved that the commanding officers of the ships from which they were sent would never get returns made to them, and that on an average three out of five have deserted as soon as they get into a con-

valescent state. Hence the propriety of having distinct establishments for the relief of sick officers, seamen and marines of the Navy." He proposes many methods of securing income besides the tax on pay already in force.

In 1811 then, (act of February 26) this separation was effected. Fifty thousand dollars were to be taken from the general fund, that amount being considered due from the unused tax of the Navy; in addition, as a means of support, all fines imposed on officers, seamen and marines and the value of stopped rations, with of course the continuance of the twenty cents per month deduction. It was authorized that suitable grounds and buildings should be acquired by purchase or construction, and in particular that one of these establishments should "provide a permanent asylum for disabled and decrepit navy officers, seamen and marines."

Unfortunately a "board of commissioners" was also provided, consisting of the Secretaries of the Navy, Treasury and War, to administer this act. Practically nothing was done from this time until 1830 or later in the way of the permanent establishments contemplated. The ensuing war of 1812 diverted the fund into other channels, and it was "absorbed" into the pay of the navy. It was not till 1827 that the principal, now amounting to more than \$120,000, was repaid (after an unsuccessful attempt in the Senate to again combine naval and merchant marine hospitals) and the interest due was not paid till 1829. What the condition of the nominally-existing hospitals of the navy was meanwhile (and for several years later still) we may learn from the records of the medical officers, through whose efforts this great reform had been instituted, and, as they hoped, accomplished. Inasmuch as after the act of 1811, the sick of the navy had to be provided for by the navy, the different navy yards then for the first time becoming of some importance, had to supply "temporary" accommodation. At Philadelphia, for example, there was a "hovel" in the old yard on the Delaware, destitute of every comfort, fit for eight patients but containing twenty-four and "the thought of each was simply to gather strength enough to desert." (1813).

In that year a "temporary" frame building was erected in place of the "hovel," which however had to be used till 1826, when the site of the naval "Asylum," so termed up to 1889, when it was renamed "Home," was purchased, the buildings already existing there serving as a hospital as well as for the few beneficiaries, until more suitable structures were erected—the present hospital not until 1868. At Washington and other places very similar accommodations existed.

Space does not allow of a full account of existing hospitals, for which we may refer to the pamphlet by Surgeon J. D. Gatewood of the Navy, entitled "Notes on Naval Hospitals, medical schools and training schools for nurses, with a sketch of hospital history," (1893) from which the greater part of these facts are taken. It will suffice to mention the dates of construction of the more important ones, premising that most have been quite recently remodeled or rebuilt, and equipped in accordance with modern ideas.

As has been said, nothing was done practically to carry into effect the act of 1811, beyond the purchase of a few sites, for many years. In 1832 an act of congress invested the Secretary of the Navy alone with the powers of the Commission composed before of the three Secretaries, stations were designated for the construction of hospitals, and thus, usually very slowly and with frequent delays owing to scarcity of funds, the following hospitals arose and may be assigned dates:

At Portsmouth, N. H., though the navy yard was established soon after 1800, there was no local provision for the sick till 1834, when a vacant frame building holding ten patients (enlarged to a capacity of twenty-five in 1865) was allotted. The building on Seavey's Island was erected in 1891.

Boston, Mass., (Chelsea) 1836.—Residence of Senior Medical Officer, 1857.

New York (Brooklyn).—Land first acquired in 1824, and patients treated in the original house and farm buildings; the permanent hospital erected 1838-40.

Philadelphia.—As already stated the present hospital building was not commenced until 1868. Before that time

the "Asylum" or "Home" was occupied as such, which itself was not completed before 1848.

Washington.—More than the usual makeshifts existed here till 1866, when the hospital now in use was erected. At first a building was rented near the navy-yard, then one was employed in the yard till 1843. Then there were successive removals to the marine barracks, and even to the Government Hospital for the Insane.

Annapolis, Md.—The Naval Academy was established here in 1845. A hospital to take the place of a small frame structure near the fort was built in 1853 and enlarged on various occasions since.

Norfolk, Va.—After 1811 quarters for sick were established in the navy-yard which appear to have been in all respects like the "hovel" in Philadelphia. The building of the edifice now situated in its fine grounds went on for many years after 1832, although the different wards and wings were occupied as completed from 1830.

Pensacola, Fla.—This yard, an important one before the war, was to a great extent destroyed then, and the hospital has since consisted of temporary frame buildings.

Mare Island, Cal.—The first permanent building (succeeding the usual "hovels") was in 1870. It was pulled down and rebuilt in wood after the earthquake of 1898.

Yokohama, Japan.—Built in 1872 and recently much enlarged and refitted.

Of late indeed, and especially since the Spanish War, much has been done in the way of erecting new hospitals, permanent and temporary, as well as of enlarging and refurnishing the old. At Newport, R. I., for infectious diseases; Port Royal, S. C.; Sitka, Alaska; Cavite, Philippines; for emergency, at Taku and Tientsin, China; at Olongapo Philippines, etc. A striking defect is still the lack of a separate institution for the treatment and care of the insane, there being but one Government hospital (for all branches and under civil control) in the East, and none at all on the Pacific coast where one is greatly needed.

The formation of naval hospitals has been rapidly traced because it marks the real origin of that "shore duty," which, under the demands of sanitary and hygienic science, is always assuming more relative importance. It is certain that the medical officers of 1811 who urged this reform were as well aware of the value of that science as we are today. In 1814 Dr. W. P. C. Barton, who entered the service in 1809, who was subsequently the first chief of the Bureau of Medicine and Surgery, in 1842, on the adoption of the Bureau system, and who died in 1856, published a work on naval hospitals and "a scheme for amending and systematizing the medical department of the Navy," which marks an epoch in the history of the Corps. It is evident that he supplied Mr. Hamilton with the material for his letter quoted above on the necessity for distinct hospitals for the Navy; and a large part of his book was taken up with the practical work of administration of such hospitals in every detail. It may be observed in passing that he usually employed the term "Marine Hospitals" when he evidently refers to naval ones, the more technical use of the words and the distinction involved being then of recent date.

His system is most elaborate, and though of necessity rendered obsolete now by the changes in hospital construction and modern improvements in almost every branch of domestic economy, it shows a capable and organizing mind. But of greater interest are his remarks on the conditions of the service generally from the standpoint of the surgeon, and the light he throws, sometimes by implication only, as it were, on the methods, customs, and abuses of that period. It appears that the mode of supplying the medical outfit left much to be desired; there were no regular allowance tables proportioned to the complement of a vessel. When Barton, still very young, entered the service, he was appointed surgeon at once and was ordered to one of the largest vessels, the "United States," with a complement of 430 men. "I soon found myself" he says "not a little embarrassed by the perplexities that I daily met with in my practice on board. The unhealth-

iness of the climate operating upon a variety of different constitutions in an entirely new crew; the change of diet and mode of life; the necessary and unavoidable exposure of boats' crews to the fervid rays of a vertical sun, as well as to the damp and heavy dews of night, and at all times to the insalubrious exhalations of marsh miasma, all combined to generate such perpetual sickness that the frigate might almost have been called a hospital-ship, the average number on the daily sick list of fevers and fluxes, being about 40. In this situation, on board of a ship just refitted, commissioned and equipped, I found myself without half the comforts and necessaries for the sick that the hospital department should have been supplied with; yet this department had been reported as replenished with every requisite article for a cruise of two years, and together with the medicine-chest had cost the Government fifteen hundred dollars. There were neither beds for the sick, sheets, pillows, pillow-cases, nor night-caps; nor was there a sufficiency of wine, brandy, chocolate or sugar, and that portion which the storeroom contained of those articles was neither pure nor fit for sick men. The medicine-chest was overloaded with the useful and choked up with many useless and damaged articles. That was the state of the medical department of this ship. Upon a representation of it, however, to her commander, Commodore Decatur, he generously allowed me all the necessaries I stood in need of, and thus enabled me to administer those comforts to my patients which they so much required. * * * * * The other ships were not better furnished than the one of which I am speaking, and I perpetually heard of complaints on this score.

"What was the cause of these abuses? The want of a regular board of medical commissioners whose peculiar province it should be to order the proper proportions and quantities of medicines, comforts and necessaries for the public ships, and who should have no interest, directly or indirectly, individually or collectively, in the furnishing of articles thus ordered."

It appears that medicines might be, and doubtless often were, sent to ships by the apothecaries who supplied them, in such quantity and of such kind as they pleased. It is easy to see how abuses might exist, and it was doubtless due in a great degree to Dr. Barton and other surgeons that they were soon after corrected.

Besides this chief abuse, Dr. Barton enumerates others. He speaks of his attempt to have "the lemon juice" introduced "in abundant quantities," "into free and liberal use in our ships." He speaks of the faultiness of the regulations respecting the responsibility of the surgeon for the safe keeping and proper appropriation of the articles entrusted to his charge exclusively for the benefit of the sick. He desires the "alteration of the present ration, or at least the liquid part of it;" the better ventilation and warming of our ships in the winter season; he, like every other surgeon of generations before and after, denounces "the practice of wet scrubbing the decks in cold and damp weather," and lastly, the "impropriety and pernicious consequences to the service of the present plan of recruiting, in which men are shipped without a strict examination by a professional man." He expects opposition as an "innovator," but appeals to Commodore Decatur, Captain Porter and Commodore Rodgers for support, and is grateful to enthusiasm for their aid in the past. He speaks not without feeling, of having been put on the half-pay list owing to his efforts for reform and makes a strong plea for promotion by seniority, indicating that "selection" was not even in those days supposed to be free from abuse.

He proposes that his "board of medical commissioners," who are to have the furnishing of the medical outfit, should also be a board of examiners of candidates for the appointment of surgeons and surgeon's mates, and a person should never be commissioned in the Navy until he had passed this board: though he adds rather curiously in a note, "Graduates in medicine should be excepted from this examination, unless there is reason to believe they have received their degree by favor."

He proposes and furnishes very complete allowance tables of all sorts for medicines, diet, hospital supplies, etc., and it is probable that many of these were practically adopted later. His remarks on the indiscriminate wetting of decks are as severe as just, and he adds "yet I was never able to convince any one of the sea officers with whom I conversed on this subject of the injury resulting from this custom."

It would appear from one of his chapters that a singular practice was then existent in the Navy, viz: that it was customary for the surgeon of a ship or hospital to receive from the purser attached thereto a fee or remuneration for each man with venereal disease whom he attended, this fee, which seems to have been five dollars, being of course charged against the unfortunate man so affected. Of course there was never the slightest authority of law or even of navy rules for this imposition; but the men did not know this, or perhaps as the author suggests, the "generous hearted tar" did not wish to incur his superior's displeasure. It is said that this practice was copied, like most of ours, from the English service, in which, however, it had been for some time disused, and a fixed compensation was allowed the surgeon by his Government. It probably did not long continue in our own Navy after this period.

We have adverted at some length to this publication because Dr. Barton was in some respects the pioneer and advocate in print of many reforms, some of which he was able to effect during his long life in the service.

In 1815 (act of February 7) an important change was made in the government of the navy by the appointment of a board of commissioners to consist of three senior line officers, who were empowered (always under the control of the Secretary) to prepare rules and regulations (the foundation of the present "Blue-Book") and generally to discharge the "ministerial duties of said office, relative to the procurement of naval stores and materials," etc. This was a revival of a similar board "of Admiralty" established by the Continental Congress in 1779 (October 28) but then consisting of "three

commissioners, not members of Congress, and two members of Congress, any three of whom to form a board for the dispatch of business; to be subject in all cases, to the control of Congress." This system lasted until 1842.

In 1807, when a general increase of pay for officers was recommended, it was observed in a letter to Congress by Robert Smith, Secretary of the Navy, that medical officers "received less than the usual profits of the private practice of physicians on shore." An elaborate estimate of the pay and allowances (rations) shows that surgeons received \$746.00 annually; surgeon's mates \$506.00. Officers unemployed were on half pay, without rations, and had to hold themselves in readiness for orders, while those on furlough were free from this disadvantage.

In 1812 the number of surgeons was 26, (three of whom were on half pay) of mates 26, with two on half pay; in 1815 (when a maximum may be assumed) 47 surgeons and 66 mates; in 1820 surgeons 47, mates 34; in 1825 surgeons 34, mates 40.

In 1818 there appeared a code of rules and regulations for the Navy, revised by the recently appointed commissioners, which defined the duties of all officers and in which we can trace the influence of Barton's suggestions of 1814, so far as careful instructions regarding care of sick, of stores, system of accounts, etc., go; allowance tables, forms of requisitions, receipts and reports similar to those of the present day were prescribed. But the commanding officer was directly charged with all sanitary and hygienic precautions (with apparently the solitary exception of lime juice) and might neglect or carry them out as he chose. A pecuniary responsibility for his outfit and supplies was fixed on the surgeon, who on reporting to a ship took possession of them and received to a Medical Purveyor or other agent, to whom he turned them over at the end of a cruise, or, in his absence, to the surgeon of the hospital or navy yard at the station where the vessel was laid up. He is allowed a "permanent attendant" or "lob-lolly boy," could stop rations of sick (more important than

than now with our modern ration), and is to report on the efficiency of his mates or assistants (who performed the duties of apothecaries), etc.

The nursing of the sick was customarily done by the enlisted man's mess-mates, and such other assistants as the surgeon needed or could get. The sick quarters then, as always, were undefined and unsatisfactory generally. A fleet-surgeon was also provided for and his duties defined. It is worth remarking also that even then a hospital ship for each squadron was contemplated but was to have no practical existence for many years later.

In 1828 (Act of May 24) the very important change was made that no one should be appointed assistant surgeon (the first *legal* notice of change of title from "surgeon's mate") without examination by a board of naval surgeons, and, equally important, that commissions to the higher grade should only be issued by promotion from the lower after service of at least two years at sea and passing of examination as before. Fleet-surgeons were also established, their duties defined and some addition made to the pay of the medical officers, according to longevity.

This was perhaps the most important legislation affecting the Medical Corps up to this time, and laid the foundation of its organization. Henceforward no appointments from civil life to the higher grade could be made, and it needed only the substitution of the Bureau system, in 1842, for the "Admiralty" of three line officers, to establish a center of administration and an *esprit de corps*. Almost all the administrative methods advocated by Barton had been carried into effect by regulation or law; and it may be remarked that the principles of improved naval hygiene and sanitation were now zealously, though generally unsuccessfully, inculcated both in writing and in practice by the surgeons of the Navy. It seems incredible now how dear the wet berth deck, "from a mistaken idea of cleanliness," as Barton indignantly says, was to the "sea officer." In fact it was never willingly given up until within the last few years modern construction made it almost

impossible. It is hard to estimate the real difficulties of ship sanitation in "old times," *i. e.* even twenty years ago, without the aid of personal recollection; it is not an exaggeration to say that the wooden auxillary-steam vessel differed more widely from the present cruiser or battleship than it did from the sailing ship of Nelson's time, in all respects, and not the least in sanitation. Rotting wood instead of steel; spaces below and in the bilges unseen and inaccessible for years, filled with muck, instead of dry, electric-lighted compartments. Now pure distilled water almost compulsory, artificial ventilation instead of practically none at all, passages measured by days instead of weeks, cold storage and ice in the tropics, a ration corresponding to modern ideas and possibilities, and above all a more humane discipline and comparative absence of drunkenness. Flogging had been abolished by act of Congress in 1850, (September 28), the grog-ration in 1862 (after September 1). All these improvements had been eagerly advocated and adopted with the advance of science by the Medical Corps of the Navy. Besides Barton we can only refer to works published by Horner, Ruschenberger, Joseph Wilson, and others, which show them to have been well acquainted with the latest discoveries of the day. One curious incident may be noted, taken from Dr. Horner's work "Diseases and Injuries of Seamen" etc., viz: That as late as 1828 it was found necessary to resort to inoculation on board the "Macedonian," homeward bound from Brazil, which vessel had been infected by smallpox just before sailing. A graphic and terrifying picture is given of this epidemic, and others occurred even later on different ships from lack of the commonest precaution on the part of their commanders.

In 1835 (act of March 3) the pay of Medical Officers as well as of others was somewhat increased, and regulated, as at present, according to the duty performed, whether at sea, on shore, or on leave. It may as well be said here, that after various changes since, the passage of the Personnel Bill (act of March 3, 1899) has assimilated the pay of all officers with

that of the Army, with the result of considerable uncertainty as to its exact amount under certain conditions.

In 1842 (act of August 31) the board of three commissioners was abolished and Bureaus were established, five in number, one of which was to be called the Bureau of Medicine and Surgery, with a Chief, to be appointed by the President with approval of the Senate, from the surgeons of the Navy. This system is still in force, the title of Chief of Bureau being changed to that of Surgeon General in 1871. Then also the grades of Medical Director and Medical Inspector were established with the futile allowance of six years in computing "relative" rank and precedence.

The complete list of these heads of the Corps, with terms of service is as follows:

CHIEFS OF THE BUREAU OF MEDICINE AND SURGERY,
1842-1902.

	FROM	TO
Surgeon WILLIAM P. C. BARTON,	1 Sept. 1842	31 Mar. 1844
Surgeon THOMAS HARRIS,	1 Apr. 1844	30 Sept. 1853
Surgeon WILLIAM WHELAN,	1 Oct. 1853	11 June 1865
Surgeon PHINEAS J. HORWITZ,	12 June 1865	30 June 1869
Surgeon-General WILLIAM M. WOOD,	1 July 1869	24 Oct. 1871
Surgeon-General JONATHAN M. FOLTZ,	25 Oct. 1871	9 June 1872
Surgeon-General JAMES C. PALMER,	10 June 1872	4 July 1873
Surgeon-General JOSEPH BEALE,	5 July 1873	30 Dec. 1876
Surgeon-General WILLIAM GRIER,	2 Feb. 1877	5 Oct. 1878
Surgeon-General J. WINTHROP TAYLOR,	21 Oct. 1878	19 Aug. 1879
Surgeon-General PHILIP S. WALES,	26 Jan. 1880	26 Jan. 1884
Surgeon-General FRANCIS M. GUNNELL,	27 Mar. 1884	26 Mar. 1888
Surgeon-General JOHN M. BROWNE,	2 Apr. 1888	9 May 1893
Surgeon-General JAMES R. TRYON,	7 Sept. 1893	7 Sept. 1897
Surgeon-General NEWTON L. BATES	1 Oct. 1897	18 Oct. 1897
Rear-Admiral WILLIAM K. VANREYKEN,	22 Oct. 1897	25 Jan. 1902
Rear-Admiral PRESLEY M. RIXEY,	10 Feb. 1902	.....

Even the briefest sketch of the history of the Medical Corps would be incomplete without some notice of the constant and increasing efforts of its leaders to effect improvements in details pertaining to the proper care of enlisted men in health as well as in sickness, in peace as well as in war. Sometimes these efforts were successful, but generally only

after long struggles and at times the most jealous and short sighted opposition from the very officers whose professional achievement or failure might depend ultimately on just such conditions. It is now so universally admitted that even under the most favorable circumstances during a war the losses and casualties from wounds received in action are infinitesimal as compared with those arising from often preventable disease, that it seems wonderful that any commander should not have welcomed any possible hygienic improvements. Yet such was very far from being the case, though, as we have seen, some of the famous captains like Decatur, Commodore Porter and Rodgers are gratefully acknowledged by Barton to have done what they could to aid the Surgeon in his often hopeless attempts. At present the value of sanitation is generally recognized by commanding officers of ships, and the vast changes of recent years, some of which have been alluded to, certainly make its practice much easier. Food, clothing, ventilation, light, water supply, dryness and warmth, and also what has been somewhat affectedly termed "moral hygiene" are now allowed to be within the medical officer's peculiar province, and in proportion to his practical knowledge of all these things, often only to be derived from experience and special study, will be his value to the service and the country.

THE RATION OF 1801.

Sunday—14 oz. bread $1\frac{1}{4}$ lb. beef, $\frac{1}{2}$ lb. flour, $\frac{1}{4}$ lb. suet, $\frac{1}{2}$ pt. distilled spirits.

Monday—14 oz. bread, 1 lb. pork, $\frac{1}{2}$ pt. peas, $\frac{1}{2}$ pt. distilled spirits.

Tuesday—14 oz. bread, 1 lb. beef, 2 oz. cheese, $\frac{1}{2}$ pt. distilled spirits.

Wednesday—14 oz. bread, 1 lb. pork, $\frac{1}{2}$ pt. rice, $\frac{1}{2}$ pt. distilled spirits.

Thursday—14 oz. bread, $1\frac{1}{2}$ lb. beef, $\frac{1}{2}$ lb. flour, $\frac{1}{4}$ lb. suet, $\frac{1}{2}$ pt. distilled spirits.

Friday—14 oz. bread, 4 oz. cheese, 2 oz. butter, $\frac{1}{2}$ pt. rice, $\frac{1}{2}$ pt. molasses, $\frac{1}{2}$ pt. distilled spirits.

Saturday—14 oz. bread. 1 lb. pork, $\frac{1}{2}$ pt. peas, $\frac{1}{2}$ pt. vinegar, $\frac{1}{2}$ pt. distilled spirits.

(In 1842, tea or coffee or cocoa was added, with dried fruits and pickles or cranberries, and allowance of spirits reduced to 1 gill.)

In the Act of Congress March 2, 1855 (five years after the abolition of the disgraceful penalty of flogging) regulating and defining legal punishments, it was prescribed that the officer ordering a court-martial must remit, in whole or in part, any punishment declared by the Senior Medical Officer present, in writing, to be liable to produce serious injury; or, without delay he must resubmit the case to the Court, or to another court having power to remit, on testimony already taken, the former punishment, and assign another (authorized one) in place thereof. This law was afterwards altered or construed to mean that a written certificate was required from the Medical Officer to the effect that the execution of the sentence (usually of imprisonment for a limited time, with reduced rations) would not produce permanent injury to the culprit.

The dress of the enlisted man was thus defined in 1818: "In winter, blue jacket and trousers, *red* vest, yellow buttons, black hat. In summer, white duck jacket, trousers and vest." It is to be hoped for the sake of humanity that a *straw* hat was understood in the latter section.

The "black hat" was that described by Joseph Wilson in 1860, as "made of the straw one by covering with linen and saturating with beeswax and black paint. It weighed about two pounds, and was polished to shine like varnish. This absurdity is probably quite obsolete, though a few specimens like mummies, may be preserved in the cabinets of the curious." ("Naval Hygiene," p. 53).

During the last forty years especially great exertions have been made by various Chiefs of Bureau to enlarge the field of this sort of knowledge by requiring reports from ships and stations annually ("sanitary and hygienic reports") of which there are many volumes containing much of value.

The advances of foreign navies are carefully noted, and encouragement was generally given to all medical officers to study and to publish. Delegates were sent to great national and international meetings of the profession. Scientific apparatus and instruments of precision were issued as far as funds would permit, especially microscopic outfits, more recently sterilizing and bacteriological apparatus, both for clinical uses and for investigation, and in fine it was endeavored to keep pace with the steady advance of medical science. A Museum of Hygiene was founded in Washington in 1882, an act of Congress (August 7) making an appropriation of \$7,500 for it: From being at first a mere laboratory of a single room, a considerable collection of objects pertaining to sanitation has been made, and since 1894 they have been transferred to the former Observatory Building. Here all microscopes are issued and returned, and it is well equipped with all necessary clinical and bacteriological apparatus for clinical analysis, etc.: a school of instruction was a part of the design, such as was instituted in connection with the Naval Laboratory at Brooklyn, N. Y., but like that, has been largely inoperative owing to the urgent need for the services at sea of young medical officers as soon as they were commissioned. It may also be mentioned that exhibits, models, etc., pertaining to the Corps have been sent to various expositions of late years.

The limit of age imposed on the entrance of Assistant Surgeons soon after the act of 1828, (from 21 to 26 years) might be and sometimes was waived by the Secretary of the Navy up to 1871, when it was fixed by act of Congress. It has already been mentioned that the maximum was raised to thirty (Act of May 4, 1898).

An important advance was the establishment of a naval hospital corps, (act of June 17, 1898), under the administration of Surgeon General Van Reypen, to whom also the Corps is indebted for the Hospital-ship "Solace," to be mentioned later.

Before this time an apothecary was appointed by the surgeon of a ship, for the cruise, with the approval of the

commanding officer; or he was later enlisted, and then rated. The result was generally unsatisfactory to the apothecary, or to the service, or both; the position was not tempting to a competent man of good character. The nurses or baymen were still more untrained and were often detailed from the more worthless landsmen on deck, as if the care of the sick was a matter of no importance. The act in question provided for 25 pharmacists, with the rank, pay and privileges of warrant officers, and for an indefinite number of hospital stewards and hospital apprentices (first and second class), according to the judgment of the Secretary of the Navy who was empowered to make regulations for their enlistment and government. Enlisted men of the Navy or Marine Corps were eligible for transfer to the Hospital Corps and vacancies in the grade of pharmacist were to be filled by the Secretary of the Navy from the hospital stewards by selection; all necessary hospital and ambulance service everywhere to be performed by members of this corps, and the corps was permanently attached to the Medical Department of the Navy. The pay in the enlisted rates varied from \$60 to \$20 per month on entrance, with the same increase on length of service as to other enlisted men, and all benefits to other warrant officers and enlisted men, now or hereafter to be allowed, were to apply to the Hospital Corps. It will be evident how much this tended to the organization of medical service, and it may be said that the result has been increasingly beneficial.

We quote from Surgeon General Van Reypen's report for 1898.

"It was known before the war [with Spain] that a corps of volunteer medical officers would be a necessity, and before war was declared, or any law passed authorizing their employment, medical boards of examination were established in Boston, New York, Philadelphia, Washington, Norfolk, and Mare Island, Cal., to examine applicants for appointment, such appointment being contingent upon their services being required. As the result of their examinations a waiting list of well educated medical men was ready, from which appointments

were made as soon as their services were required after the declaration of war. Over two thousand applications were received but only a small proportion were examined. Out of this number 42 were appointed assistant surgeons. They have rendered efficient service and have been a credit to the Navy. Some have had unusual and trying experiences but they have accommodated themselves to their environments and have justified their appointments.

"One of their number, Assistant Surgeon John Blair Gibbs, was killed in action at Guantanamo while serving with the Marine Battalion. He was the only medical officer killed during the war.

"In addition to the above appointments, 11 passed assistant and 8 assistant surgeons were mustered into the service with the Naval Reserves from the several States."

Many or most of the appointed acting assistant surgeons were afterwards taken into the regular service in accordance with the Surgeon General's recommendation, their age being waived, (act of June 7, 1900) thus increasing the Corps by 25. By the same act assistant surgeons were given Army rank, which obviated the disagreeable necessity of their going to sea in a steerage.

Another act of this Surgeon General, which has reflected great credit on the Corps is the establishment of the hospital or ambulance ship "Solace," formerly the "Creole" of the Cromwell line of steamers.

This vessel was selected, purchased, and fitted out by him by authority of the Secretary of the Navy and under direction of the President personally at his solicitation, in the remarkably short time of sixteen days, and the service she rendered in Cuba will be still remembered. She was indeed "the pioneer in her work, and indicates a step in advance that it well became the United States to take." (Report of 1898). She was fitted out under the requirements of the Geneva Convention and flew the Geneva Cross flag. She had a modern and ideal operating room with all aseptic and sterilizing apparatus for surgical work, a staff of four medical

officers, three hospital stewards (one a skilled embalmer), eight trained nurses, a cook, four messmen, and two laundry-men, specially appointed for this service. The energy, fore-sightedness, and executive ability of Surgeon General Van Reypen were highly exemplified during the whole course of the war, and added to the reputation of the Corps.

No special mention has been made of the various wars and combats in which this country has been engaged during the past century, and in which the Medical Corps of the Navy took part; first, because the nature of their duties is such that *military* fame—the fame that comes from destroying life—is out of the question and quite apart from them except in a few isolated cases of petty warfare; and second, because the real and often not the least dangerous combats waged by the medical men, are waged in time of peace, and are perpetual. In active service, in the technical sense, his risks are not so much greater by comparison, while his services are more valued and his recommendations more likely to be considered. It is true that in the very important branch of operative surgery, only the constant practice that comes from a prolonged and bloody war can give him the chance of reaching the eminence of the great leaders of the profession in civil life, and perhaps the days are past when a Larrey took precedence of all operators. Yet it is with an honorable pride that we can claim that for many years at least, our actual bodily risks in war itself are about the same as those of other officers. In the Army, the long-range projectiles have made the "zone of fire" a wide one, and wounded men on the field would fare but ill if their ambulances waited for perfect safety to relieve them. The records may speak as to that. On board ship the old disparity of "on deck" and "below" has long passed away. One spot is about as safe as another, all things considered, in action, while in accidental casualties, wrecks, collisions, etc., all on board pay an equal tribute. In the great Civil War five medical officers were reported lost in vessels sunk by the enemy, or killed in action, and nineteen of the line. Among the few commissioned officers of the Navy who lost their lives

during the war with Spain, was, as already noticed, Assistant Surgeon John Blair Gibbs, on shore at Guantanamo. Passed Assistant Surgeon Lung at Samoa did more than his duty, and undoubtedly helped materially to bring in the party of men with him after the lamented death of their commanding officer. Assistant Surgeon Lippitt received a wound at the siege of the Legations in Pekin. Many more such instances might be given, but it is not desired to extol unduly the merits of the living, nor would it be agreeable to them. Personal bravery, even in trying and unfamiliar emergencies is only what is expected and often demanded from all officers in military service. But two examples of unusual heroism, where devotion to duty has been sealed and consecrated by inevitable and anticipated death, may well be cited for the honor of the corps to which the heroes belonged. The barest and briefest records are the best. In a description of the engagement at Fort Fisher, January 15, 1865, Lieutenant-Commander (now Rear Admiral) T. O. Selfridge says: "While kept under the walls of the fort, I was an eye-witness to an act of heroism on the part of Assistant Surgeon William Longshaw, a young officer of the medical staff, whose memory should ever be kept green by his corps, and which deserves more than this passing notice. A sailor too severely wounded to help himself had fallen close to the water's edge, and with the rising tide would have been drowned. Dr. Longshaw at the peril of his life went to his assistance and dragged him beyond the incoming tide. At this moment I heard a cry from a wounded marine, one of a small group, who, behind a little hillock of sand close to the parapet, kept up a fire upon the enemy. Longshaw ran to his assistance, and while attending to his wounds was shot dead. What made the action of this young officer more heroic, was the fact that on that very day he had received a leave of absence, but had postponed his departure to volunteer for the assault." ("Battles and Leaders of the Civil War," Century Co., Vol. IV, p. 661).

Dr. Longshaw had previously distinguished himself by carrying under fire a line in a boat to a monitor aground on a bank, at the attack on Fort Sumter.

It is difficult to surpass the heroism of such a sacrifice as this of Dr. Longshaw's where he gave his life to his strictly professional duty, not to mere recklessness and ostentatious valor. Yet an even more affecting one is that of Passed Assistant Surgeon James M. Ambler (born in Virginia, December 30, 1848), Surgeon of the ill-fated "Jeannette," Arctic Expedition, who died, probably the very last of his separate party in the Lena Delta, October 1881. There again let the record speak, taken from the tablet erected to his memory by his brethren of the Corps, and now in the Naval Museum of Hygiene, Washington. The simple, unconsciously pathetic and noble words quoted from his diary, which could only by the merest chance ever be found, written in such miseries of suffering and starvation as war can hardly parallel, are his best memorial:

THE MEDICAL OFFICERS OF THE NAVY
IN MEMORY OF DR. AMBLER'S NOBLE EXAMPLE
AND HEROIC DEATH

HAVE PREPARED THIS TABLET.

* * * * *

James Markham Ambler, Passed Assistant Surgeon, U. S. Navy, was born in Virginia December 30th, 1848; entered the naval service as an Assistant Surgeon April 1st, 1874; volunteered as the Medical Officer of the U. S. Jeannette Arctic Expedition and died with his companions on the banks of the Lena River in their memorable retreat from the Arctic Ocean and the desperate struggle with cold, storms and starvation.

Dr. Ambler was one of the strong men of that expedition; cheerful and heroic in the face of every danger, he willingly and apparently without effort sacrificed his life to remain with his Commanding Officer and sick and dying companions.

The following extract from Dr. Ambler's Journal tells the story which has been partially reproduced in bronze:

"Sunday, 9th October, 1881.

"Yesterday without food except the alcohol; the Captain spoke of giving the men option today of making their way as best they could * * *. I told him if he gave up I took command, and no one should leave him as long as I was alive. I then suggested that we send two men ahead to try and make the settlement, and that we make the best of our way with the rest of our party. This was done: Ninderman and Noros are ahead. God give them aid: and we are getting along.

"The Captain gave me the option of going ahead myself but I thought my duty required me with him and the main body for the present."

It is only necessary to mention the name of Elisha Kent Kane, who entered the Medical Corps of the Navy July 21, 1843, and died February 16, 1857, at Havana, his health broken by the hardships of his voyages of exploration.

W. P. C. Barton (born in Philadelphia in 1783,) of a family distinguished in American medicine through several of its members, and whose volume already mentioned is perhaps the most reliable source of information for the earlier history of the Corps, also published two works on the Botany of Philadelphia and of the United States.

W. S. W. Ruschenberger, who passed a long life in the service, was the author of several books on natural science, as well as of at least one description of a cruise abroad.

G. R. B. Horner, author of "Diseases and Injuries of Seamen," "The Medical Topography of Brazil and Uruguay" etc., may yet be consulted with profit by those desirous of getting a glimpse of the "old Navy."

Joseph Wilson (Medical Director, entered service in 1843, died 1887) published the first American titular work on Naval Hygiene, though his predecessors had included very many observations on that science in their volumes.

The late Medical Director A. L. Gihon, only recently deceased, has also written a handbook on this subject, and was recognized as an authority both in this country and elsewhere.

Of those still living, but retired from active service, the Corps may be proud to claim Medical Director Edward Shippen, whose various literary and historical writings, both in book form and in periodicals, are well known beyond the limits of the Navy; and Medical Director James M. Flint, whose researches in natural science have given him a reputation, especially as an authority on the Foraminifera.

The most important subject pertaining to the history of the Medical Corps of the Navy, not merely as regards its status and dignity in the Service, but still more its efficiency in the discharge of its duties for the common benefit, is that of the rank and the standing of its members. It was at first my intention to give an abstract, however brief, of the continuous

efforts of the Corps to secure such a position as had long before been given the medical officers of foreign navies, and which was granted our brethren of the Army as early as 1848. These efforts begun certainly by 1812 (and here again reference must be made to W. P. C. Barton's work, already so much quoted) met with the approval and very generously expressed sympathy of many of the old Captains famous in the war with Great Britain, and, generations later, of the illustrious Farragut. It is not necessary to argue the justice of these claims before the readers of this paper. But even the barest statement of the contest between the Medical Corps (in common with the other Staff Corps of the Navy) and the main body of the Line Officers, which reached its maximum of intensity a few years after the Civil War, is impossible without reviving feelings better forgotten or ignored.

“incedis per ignes
Suppositos cineri doloso.”

—(Horace, *B. II, Ode I.*)

It is hoped that not only recent legislation, especially that already alluded to, doing away with the absurd term “relative” in defining “rank,” but also a better understanding between the different branches of officers of the Navy, may have laid the foundations of a real harmony and a consequent administration of duties without encroachment or undue pretension on either side.

Reference may be made, for the benefit of those who are interested in this matter, to the work, “The Principles of Naval Staff Rank,” published in 1869, by “A Surgeon in the U.S. Navy” (believed to be the late Medical Director George Clymer: died 1881) and to all the “manifestoes,” “remonstrances” and other published communications of Line officers, which were generally republished and circulated by the Staff, with or without comments, as their own strongest argument, and herewith I dismiss the subject.

THE MEDICAL CORPS OF THE NAVY FROM THE
OUTBREAK OF THE WAR WITH SPAIN
TO THE PRESENT TIME.

By CAPTAIN ROBERT AUGUSTINE MARMION,
MEDICAL DIRECTOR, UNITED STATES NAVY.

HERE is probably no Executive Department of our Government concerning whose organization and workings less is known by the public at large than the Navy. If this be true of that branch as a whole how strongly must the remark apply to the many bureaus which enter into its composition. A distinguished member of Congress who was already serving his constituents for a fourth term, once asked me, "Who are the staff corps of the Navy?" He had just emerged from the House of Representatives where he had been an unwilling listener to an acrimonious debate on matters appertaining to the line and staff of the Navy. The bitterness of this debate and the strange things which he heard, so aroused his curiosity that he went in search of information from some other member who, he was sure could explain matters to him, for three years service as a Colonel during the Civil War did not avail him anything.

As the net result of his inquiry in the House he learned that "staff officers in the Navy are those who are on duty in Washington." It is probable that most naval officers have, many times, witnessed displays of ignorance no less glaring than this, even in quarters where one would not expect to find it. This complaint can not be made concerning the Army for frequent contact with it has schooled our people sufficiently for all practical purposes; whereas there are many millions of our citizens who have never seen a man-of-war and have had, perhaps, no provocation for studying any of the details of our naval organization. I do not purpose in

this paper to enter upon so rash a work as an explanation of the organization of the Navy as it exists now. While all branches of the service have, for years, suffered in various ways and to a varying degree, from the fact that so little has been and is known concerning us and our wants, it is only with the medical corps of the Navy that I shall deal, viewing it as it has been since the outbreak of the Spanish War, especially in matters of organization and duty. At the beginning of the period referred to the Medical Corps consisted of fifteen Medical Directors with the relative rank of Captain, fifteen Medical Inspectors with the relative rank of Commander, fifty Surgeons with the relative rank of Lieutenant, or of Lieutenant-Commander, and ninety "Assistant Surgeons" with the relative rank of Ensign or of Lieutenant (Junior Grade). The Act of Congress approved March 3, 1871, by which the general features of this organization were created, provided that Assistant Surgeons who shall have served three years two of which must have been on board of a naval ship in commission, shall be entitled to examination for promotion to the grade of Passed Assistant Surgeon wherein they should have the relative rank of Lieutenant [Junior Grade] or of Lieutenant, and with pay increased beyond that which they received as Assistants, with an increase for their second five years as such. The same law authorized an increase of pay for second five years of service as Assistant Surgeon; but few, if any, ever remain that long in that grade since the law provided for promotion, under certain conditions, at the end of three years service, and as the number of Passed Assistant Surgeons was not limited, it was, and still is, possible for all in the lowest commissioned grade of the Medical Corps to be Passed Assistants. This never happened, as a matter of fact, but such a condition would not have been in conflict with either the letter or the spirit of the law. I have stated that the organization of the Medical Corps of the Navy which existed at the outbreak of the war with Spain was, practically, that which was created by the Act just named. The only change in the organization which

had taken place since the passage of that Act was a reduction of ten in the number of Assistant Surgeons caused by an Act approved August 5, 1882. As the Corps had had more than ten vacancies in it for a long time, this reduction was never felt. When it seemed to all students of our foreign relations that war with Spain was a matter of the near future, Surgeon General Van Reypen of the Navy asked that Congress grant the power to appoint twenty-five Acting Assistant Surgeons for temporary service. The new Navy had gone on increasing at a rapid pace, many new ships were actually in commission, many more had been appropriated for, and the enlisted force was growing by fresh levies provided for by each Congress, and yet, in spite of the fact that the burthen of the work for the Medical Corps necessarily kept pace with the increase of the enlisted force, no provision had been made for increasing, in any manner, the working force of the Medical Corps. The logic of the situation appealed strongly to Congress, and the request for the temporary relief was granted in an Act which was approved May 4th, 1898. Thus with the one hundred and ninety-five medical officers on the active list allowed by already existing law and the twenty-five temporary appointments recently authorized, the war with Spain found us equipped with a possible corps of medical officers on the active list of sufficient size, as the sequel proved, to satisfactorily perform all of the medical and surgical work incidental to that conflict. An old clause of the Revised Statutes, approved March 3d, 1873, gives the President power to place any retired officer on duty in time of war, and thus it was possible for the navy to utilize a number of the retired medical officers for such shore duty as recruiting, etc., thus increasing the number of able-bodied medical officers available for sea duty.

The most important change in the status of the Medical Corps of the Navy is that which was effected by an Act approved March 3rd, 1899, and usually known and spoken of as the "Personnel Bill," since its provisions related entirely to matters of organization of the personnel. While no increase

of members nor changes of titles were wrought by that measure in the commissioned personnel of the medical corps, general legislation was embraced in it which had been sought for during a period of nearly forty years. In the preceding remarks on organization the words "relative rank of" have been frequently used in explaining the legal status of the various grades from a military standpoint. The word "relative" had been found, by actual test, to be a thorn in the side of the medical corps in common with all of the staff corps. It was intended, and believed by Congress, when the act of March 3rd, 1871, was passed, that all questions of rank and precedence between officers of the line and of the Staff of the Navy would be settled, for all time by that measure, and the word "relative" as qualifying rank in the staff corps would, it was claimed, not be prejudicial in any way and thus the hostile feeling existing between Line and Staff would be forever appeased.

That dream was not realized, however, for when the question was asked as to what "relative rank" meant it was found that there were many conflicting opinions. The late Honorable George M. Robeson, who had then been Secretary of the Navy for two years, when asked by one of the senior medical officers of the Navy what his explanation of "relative rank" was, replied that after a most careful study of the matter he had been unable to understand it. A question so complex and leaving so much room for individual interpretation, naturally led to many disagreeable consequences, both in its effect upon the discipline of the service, and in the social relations of its officers.

Probably nothing has done more to turn away young medical men from our corps, than the evils growing out of that unfortunate status, in which the term "relative rank" placed us. Where there is so much bitterness as existed at times there was sure to be much misunderstanding and much misrepresentation. In some instances a crusade was preached, in medical colleges, against the laws governing the naval medical corps and undergraduates were warned not to enter it. By





Model of the United States Ambulance Ship, "Solace."

the terms of the personnel bill medical officers of the Navy were given rank as definite and positive as that which is borne by officers of the line. That bill also established a payable by whose provisions the Line, Medical and Pay Corps receive an increase of pay every five years, and are, also, allowed a definite sum ("commutation") for quarters according to their rank in cases where quarters "in kind" are not furnished by the government. Prior to the passage of this Act there had not been any such provision.

The most distinct, and, at the same time, the most interesting advance, in a professional way, since the equipment of our hospitals with aseptic operating rooms, is represented in the ambulance ship "Solace" which was first put in use during our war with Spain. To Medical Director Van Reypen, then Surgeon General of the Navy, is due the credit of this most valuable adjunct to the fighting fleet. Under his administration and controlled by his views, the vessel was equipped and in service throughout the recent war. When one considers all of the conditions that had to be dealt with, in making a sea going vessel meet all of the essential requirements of a modern hospital, where surgical cases form such a large part of its patients and where, therefore, asepsis is so difficult to secure, the statistics of the "Solace" are most flattering. I feel that I can not give a better idea of the arrangements and resources of this vessel, than by quoting the description given of her by Passed Assistant Surgeon Stokes of the Navy, who was attached to her. Dr. Stokes says:

"She is primarily a vessel adapted for the care and welfare of sick and wounded men, and all other considerations are made subservient to this end. She has a displacement of 3600 tons, and an average speed of 14 knots; is 352 feet on the load-line and about 370 feet over all. Forward, below is a tank of 27,000 gallons capacity. The ship carries powerful steam launches and barges for transferring the sick and wounded at sea. On the upper deck on both sides there are steam winches for hoisting and lowering the wounded, or

boats, which can be used simultaneously. On the uppermost deck are some of the officers' quarters, and offices; on the next deck, forward, is an operating room 30x30 feet, well lighted and magnificently equipped with aseptic hospital furniture of the best pattern, and the outfit of instruments, sterilizers, dressings, etc., is complete in every detail. The floor is so tiled that it can be easily cleaned and slipping avoided. A dressing room and a dispensary adjoin the operating room. On this deck are mess rooms for the officers of the ship, for wounded officers able to be about, and for the petty officers of the ship. There is a lounging and smoking room for those able to be on deck.

"On the engine-room deck is a fully equipped steam laundry, with a drying room, and a disinfecting chamber for wash clothes. An ice-machine has been set, and a cold-storage room of good size is ready for use. The ship is equipped with three large formaldehyd generators.

"There are numerous staterooms for wounded officers, and the men will be berthed in spacious wards in the forward and after parts of the ship, below, which will be ventilated by powerful blowers and supplementary electric fans. The vessel is heated by steam and lighted by electricity throughout. There will be accommodations for about 350 patients.

"There are four medical officers attached to the ship: three apothecaries, one of whom is a trained nurse and an embalmer; eight graduated nurses from the Mills Training school, Bellevue Hospital; two laundrymen and a cook. Four mess attendants for the sick and wounded complete the medical department of the ship.

"As soon as an action is over the steam-launches of the 'Solace' will tow their barges alongside the ships that have been in action, and the wounded will be lowered into them, and the boats will return to the ambulance-ship, when the wounded will be brought on board and placed in the surgeon's care for treatment. With the facilities at hand the results ought to be excellent.

"In no sense is the 'Solace' a hospital ship. When it is found that a second action is not impending she will steam to

the nearest hospital and place her sick and wounded on shore for treatment, and will then rejoin the fleet. Should the army invade Cuba, it will probably fall to her lot to transfer its wounded to Key West. The vessel is more properly designated an 'ambulance ship.'

"This ship will fly the Red Cross and will be protected by the articles of the Geneva Convention."

Of the twenty-five Acting Assistant Surgeons for temporary duty, authorized by Congress in May, 1898, who were employed during the Spanish War, some resigned and others entered the permanent service; so that, by June 7th, 1899, this number had been reduced considerably. Congressional action, approved on this date, authorized the transfer to the regular navy of the remaining fifteen thus extinguishing the "volunteer navy" so far as its medical corps is concerned. At the same time, the grade of Surgeons on the active list was increased from fifty to fifty-five and the number of Passed and other Assistant Surgeons was increased to one hundred and ten. Another clause of that Act provides that "Assistant Surgeons in the Navy shall rank with Assistant Surgeons in the Army, thus raising, by one grade, the rank of entrants, namely, from that of "Ensign" (assimilated to Second Lieutenant in the army) to that of "Lieutenant Junior grade" (equivalent to First Lieutenant). By further legislation all officers appointed to the Navy from civil life are credited with five years seniority. The effect of this upon the pay of entrants will be referred to by and by.

To summarize, then, the Medical Corps of the Navy as at this moment authorized by Congress consists of:

TITLE.	NUMBER.	NAVAL RANK.	EQUIVALENT ARMY RANK.
Medical Director,	15	Captain,	Colonel,
Medical Inspector,	15	Commander,	Lieut. Colonel,
Surgeon,	55	Lieutenant, or Lieut. Commander,	Captain or Major,
Passed Assist. Surgeon,	} 110	Lieut. Jun. Grade or Lieutenant,	First Lieutenant or Captain,
Assistant Surgeon,		Lt. Jun. Grade,	First Lieutenant.

Following is a table showing the pay and allowances per annum of Medical officers:

PAY TABLE.

	AT SEA.	ON SHORE.	ALLOWANCE PER ANNUM.
Assistant Surgeons:			
Rank of Lieutenant (junior grade).	\$1,650.00	\$1,402.50	\$288.00
Passed Assistant Surgeons:			
Rank of Lieutenant (junior grade).	1,650.00	1,402.50	288.00
After five years in the service...	1,800.00	1,530.00	288.00
Rank of Lieutenant	1,980.00	1,683.00	432.00
After five years in the service...	2,160.00	1,836.00	432.00
After ten years in the service...	2,340.00	1,989.00	432.00
Surgeons:			
Rank of Lieutenant—			
After ten years in the service...	2,340.00	1,989.00	432.00
After 15 years in the service....	2,520.00	2,142.00	432.00
Rank of Lieutenant-Commander—			
After ten years in the service....	3,250.00	2,762.50	576.00
After 15 years in the service....	3,500.00	2,975.00	576.00
Medical Inspectors:			
Rank of Commander—			
After 15 years in the service....	4,000.00	3,400.00	576.00
Medical Directors:			
Rank of Captain—			
After 15 years in the service....	4,500.00	3,825.00	720.00
Surgeon-General:			
Rank of Rear-Admiral.....	5,500.00	5,500.00	720.00

Officers serving on shore in Puerto Rico, Cuba, the Philippine Islands, Hawaii and Alaska receive the same pay as allowed in this table for "sea duty."

Perhaps, all things considered, it is not surprising that so many false ideas are prevalent regarding many of the details of life in the medical corps of the Navy, and foremost among these is the impression that political influence is an essential pre-requisite in securing an appointment to it. Our people are so much in the habit of thinking that no appointment under the National Government can be secured except through Civil Service channels, or through the backing of strong political friends. As a matter of fact the former has no bearing and the latter is not important. There is no per-

manent appointment in the regular naval medical department with which the Civil Service Commission has anything to do, and all that any influential friend can do—and he need not be a politician—is to supply an intending candidate for the corps with a letter certifying to his character as a reputable person. The law requires that all candidates for appointment in the Medical Corps of the Navy shall be citizens of the United States, over twenty-one and not over thirty years of age, and that they must be examined by a Board of medical officers of the Navy to determine their physical, mental, and professional fitness for such appointment. Boards of this kind are always in session, namely one at New York Naval Hospital and one at Mare Island, California, Naval Hospital. Permission to be examined by one of these Boards, is easily obtained by asking the Secretary of the Navy for it, and circulars containing information as to the examination, may be secured by asking the Surgeon General: so that practically, from first to last, the candidate has his case in his own hands. The Board before whom he appears is sworn, in his presence, to examine him without prejudice or partiality, and he needs no outside aid to insure him justice. It is not necessary for me to go deeply into the details of this step since the subject has been exhaustively treated by Surgeon General Van Reypen in the April 27th, 1901 issue of the *Medical News* (of New York). The examination is thorough but it cannot be called unjust. Of course some fail to pass it: to lower the standard, however, would be a step backwards and would be disastrous to the lives of the many who are often at the mercy of the Medical Officer. Our professional brethren on shore may at short notice summon a colleague to advise and assist, and, it may be to share the responsibility of a desperate situation: the naval doctor often finds himself many hundreds of miles and very many days distant from a professional brother to whom he might turn for aid of any kind. He must rely solely upon his own professional resources, and the examination which he is called upon to submit to, is so modeled as to determine whether or not he is rich enough in those resources to be worthy of

appointment. If found qualified within the meaning of the law, the candidate is commissioned as an Assistant Surgeon, with the rank of Lieutenant—Junior Grade—in other words with the same rank as borne by officers of corresponding title on entering the Army. From 1871 to 1899 an Assistant was invested on entering with the relative rank of Ensign which is one grade lower than that with which he now enters. This latter rank made him a member of the "Junior Officers" ("Steerage") Mess, where, perhaps, all of his mess-mates were junior to him in age and rank, and where no end of discomfort awaited him. A knowledge of this fact has, probably, done more to deter young men from entering our corps than any other single cause. Happily this objection no longer prevails and all Assistant Surgeons are now members of the Ward-room mess which is composed of all the highest commissioned officers below the rank of the commanding officer of the vessel. Under normal conditions the first assignment of the newly-appointed is to the Naval Laboratory and Department of Instruction, at the New York station. Here he is taken through a special course, occupying several months and whose general scope is to go more deeply into certain subjects embraced in the college curriculum and, also, to receive instruction in special subjects, relating to the duties of a medical officer in the navy, and with which he could not be expected to be familiar before entering the service.

His next assignment is likely to be to a hospital, or, possibly, to a receiving ship, whence he is sent to a cruising ship or foreign shore-station. In this connection it may be of interest to exhibit a list of shore stations to which medical officers of the Navy are assigned for duty: Portsmouth, N. H.; Boston, Mass.; Newport, R. I.; New York City; Philadelphia; Annapolis, Md.; Washington, D. C.; Norfolk, Va.; Port Royal, S. C.; Pensacola, Fla.; Havana, Cuba; San Juan, Puerto Rico; San Francisco and Mare Island, California; Puget Sound, Washington; Honolulu, Hawaii; Yokohoma, Japan; Manila and Port Isabela and several isolated posts in the Philippine Islands, and Guam. Add to these shore sta-

tions seventy-seven vessels cruising in various parts of the world, and it will be seen that the naval doctor has the whole world before him as a field for his work. The acquisition of new territory, therefore, has more than a sentimental importance to him. To the pleasure derived from visiting strange countries and coming in contact with things which, hitherto, have had but a traditional existence for him, there are added the possibilities of a more or less prolonged residence among new types of mankind whose language, literature and mode of living are inexhaustible wells of interest to him. As a student of his profession he finds an abundance of material for study in the diseases which are peculiar to those climates and some of which can not be found elsewhere, while, in many instances, he is enabled to add largely to his stock of information on collateral subjects to a degree that could not be attained in any other way.

There are many instances in which members of the medical corps of the navy have enriched science and literature by work which has been suggested by travel and which would not, otherwise, have been undertaken by them. There are numerous instances of this in our national scientific archives and museums, for example. It has always been the policy of the Bureau of Medicine and Surgery to encourage study and original research, and if there has been, at times, an apparent indifference, it has been due to a lack of funds. Congress has not always been as generous in its appropriations as it is at present and there is good reason for believing that it will not be long before the scope of instruction which has existed in our "Department of Instruction" will be broadened far beyond its former limits. Habits of study are to be fostered and facilitated in all grades. There is no one to whom foreign doors are more quickly thrown open than to our national officers, and this is not confined to strictly official life, by any means. Thus many opportunities are promptly at our command which our lay brethren may only secure with difficulty, and often, not at all. In this way, too, one finds himself richly repaid for the time spent in the study of a language which will facilitate his intercourse with the new peoples among whom so much of his life may be spent.

The duties of the medical officer are, in the main, professional, but upon him devolves a responsibility which is second in importance to none other. It is his province, first of all, to prevent disease by his vigilance and timely warning, and, secondly, to bring to its management all of his ability and zeal. A moment's reflection will show that where he has no colleague on board of the ship there is no one to whose shoulders he may transfer his responsibility. This is true of no other officer in a man-of-war. While, therefore, succession to posts of responsibility on board ship is secured by the presence of persons qualified therefor (except in the case of the Medical Department, which often has but one commissioned representative in the ship's complement), it cannot be said that the position of the latter is thereby rendered less attractive.

The medical officer cannot look forward, with confidence, to opportunities which will load him with military honors, but he has the satisfaction of knowing that there are paths to glory which are not made by the sword. The roll of honor of our Corps contains the name of many a hero, who gave the most that any one can give to his country's cause—his life—and that list is constantly growing in peace as well as in war. Instances are not, by any means, wanting in any of our wars, where Naval Surgeons have received their baptism of fire in the performance of purely military duties, which have been recorded in history as deeds of special heroism. One's duty to his country is not circumscribed by strictly professional lines; and when the surgeon's presence is not needed at the operating-table, often we find him serving gallantly in other quarters.

Medical Inspector Rixey was appointed Surgeon General in January last, and is rapidly acquainting himself with the wants of our department. Already he has asked Congress for an increase of fifteen in the list of Surgeons and twenty-five in the list of Passed Assistant and Assistant Surgeons. With the many advantages and attractions which the Naval Medical Service now presents, it should not be long before all vacancies in the Medical Corps are filled by desirable men, when once, the great changes recently made in its organization are understood by the profession at large.

THE TRANSMISSION AND PREVENTION OF YELLOW YEVER.*

BY LIEUTENANT COLONEL VALERY HAVARD,
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ONE of the most brilliant medical discoveries of the age, fully as important to Tropical America as that of the immortal Jenner, was made in Havana during the last two years, and it will be the boast of this city that here was solved the momentous problem of the transmission and propagation of yellow fever, a solution of such practical significance that it indicated at once the measures which have completely succeeded in stamping the dreadful scourge out of Cuba.

With this discovery, two names are chiefly associated, that of Carlos Finlay who many years ago first enunciated the doctrine, and that of Walter Reed, president of the commission which established it. Plain justice also requires that our tribute of praise should be given to the Governor General, General Leonard Wood, whose keen interest in all scientific progress and wise liberality made this discovery possible.

So much has already been written and spoken about this subject that it seems like a work of supererogation, if not an imposition upon this Congress to take it up again. For my justification I wish to say that it was the desire of our distinguished president that I should prepare this paper, thinking that, at least for the benefit of the foreign members who have not had the opportunity of following the experiments of Reed and colleagues, a brief and clear presentation of the results obtained would certainly be desirable. Furthermore, it is necessary that this Congress, which so worthily represents

*Read before the Pan American Sanitary Congress in Havana, Feb. 29, 1902.

the medical profession of America, should, after mature deliberation, reach practical conclusions concerning the new doctrines of the transmission and prevention of yellow fever and it is my sincere hope that it will give them the stamp of its official recognition and approval.

Yellow fever is an infectious disease inoculated, like malarial fever, by the sting of mosquitoes; it is therefore not contagious in any sense of the term and no more communicable than malarial fever. That it is conveyed by mosquitoes, as intermediate host, has been proved beyond a reasonable doubt by the experiments of Reed, Carroll, Agramonte, Guiteras and others, with the accuracy and certainty of a mathematical demonstration, and no medical man who accepts these experiments has any more ground to reject the conclusions, inevitably reached by the logical mind, than he has to deny the efficacy of vaccination or of diphtheria antitoxine. In 24 experimental cases, publicly conducted at Quemados and Las Animas Hospital, yellow fever followed the bite of infected mosquitoes in non-immune men and women within the usual incubation period, and in each case the diagnosis was verified by the official commission of experts consisting of three Cubans and one American. Of these 24 cases, 3 died, and the pathological changes in all three, as revealed by post mortem examination, were, like the clinical symptoms, characteristic of the disease. It is hardly necessary to add that every precaution had been taken to avoid all possible chances of infection previous to the application of mosquitoes.

How many species of mosquitoes can transmit the germ of yellow fever? Only one is known to have this power, namely, *Stegomyia fasciata* (*Culex* mosquito, *Culex fasciatus*) first identified and experimented with by Finlay. Since this germ exists in the blood of patients, it follows that all mosquitoes which suck this blood ingest it and to that extent become infected. Whether this infection has any effect, injurious or beneficial, upon their life or power of reproduction is not known; such effect, if any, must be very slight; it is certain that they are nearly all incapable of communicating the in-

fection to man; in the *Culex* species, for instance, we must suppose that the germ is either destroyed, fails to find its way to the salivary glands, or else does not undergo the necessary transformation which renders it pathogenic to another host.

That *Stegomyia fasciata* is the only transmitting species is probable but has not been proven; it is possible that other species of *Stegomyia* may also possess that dangerous peculiarity. Thus, although *Anopheles maculipennis* is by far the most important species concerned in the transmission of malaria in Italy, the United States and Cuba, yet there are four other species of the same genus which have been found to harbor the parasite of Laveran. Filariasis is only known to be conveyed by one species, *Culex ciliatus* (*C. pipiens*). To the practical sanitarian, however, the question is not so much to know absolutely all the species capable of transmitting an infection, but rather what are the dangerous species commonly present in any one locality so that means may be devised for their destruction.

Stegomyia fasciata is found in the Southern United States, the West Indies, Central America, and eastern South America, that is to say, wherever yellow fever is endemic or epidemic. The 2 or 3 other species of this genus in America are quite rare and may be discarded as a practical factor in the causation of yellow fever. Although quite widespread, *S. fasciata* is nowhere so abundant as several species of *Culex*, being often completely absent where other kinds abound. Thus it was a most remarkable fact that during the epidemic of yellow fever of 1900, in Havana, none of the many non-immune nurses and employes of the yellow fever hospital (Las Animas) contracted the disease, although at that time mosquitoes were common and no particular care was taken to protect patients from their bites. This immunity was explained when, after a thorough fumigation, all the dead mosquitoes were examined by Dr. Guiteras and an exceedingly small proportion of them found to be *Stegomyia*.

The opinion has also been advocated that other suctorial insects, such as the bedbug and the flea, are capable of trans-

mitting yellow fever. Here it is necessary to bear in mind that this disease is not the result of blood inoculation from patient to non-immune by the mosquito's proboscis, but of the transmission of a specific germ in a pathogenic state. It has been seen that *Culex* mosquitoes, although absorbing blood with much vigor, are incapable of communicating yellow fever, and there is no serious proof that the bedbug and flea are capable of doing so. On the contrary, there are obvious facts which lead us to believe that they have absolutely nothing to do with it; thus, these insects are found all over the civilized world and at all seasons; whence comes it that yellow fever is strictly confined to certain tropical and sub-tropical zones, and only prevails in summer and fall? It may be answered that the germ is delicate, very sensitive to cold, and only thrives in warm countries. Why then is the disease absent from the Mediterranean Basin, North Africa and tropical Asia where the climate is certainly warm enough and the bedbugs and fleas are proverbially active? We also know that yellow fever is not only found in the hovels of the poor, where vermin may be abundant, but also and often in the mansions of the rich where cleanliness is the rule. In such mansions, yellow fever patients may complain of having been bitten by mosquitoes but never give any history of having been disturbed by bedbugs or fleas.

When is the yellow fever patient infectious, that is capable of infecting mosquitoes? Only during the first stage of the disease, namely the first three days. It is doubtful whether the germ can be conveyed to the mosquito during the first part of the first day, and it is probable that it can occasionally be conveyed on the 4th day; the exact limits have not yet been defined but it can be considered practically established that mosquitoes can bite patients after the 4th day with entire impunity. Therefore if the patient is protected with a fine-mesh screen during the first, or infective, stage, he ceases thereafter to be a source of danger to anyone.

When does the mosquito become pathogenic? This is one of the most interesting points of the whole subject. The

Stegomyia mosquito which has fed on a patient during the first three days of the disease becomes infected but cannot communicate it for a certain number of days afterwards; that is to say, as already mentioned, the disease is not the result of an inoculation of blood from man to man through the insect but of a more complicated process. Reed and his colleagues showed that the mosquito cannot infect man until at least twelve days have elapsed from the time it sucked infected blood. It had been observed, long ago, that secondary cases never appeared in less than sixteen to twenty days after the date of inception of the original case, a period of time which we now know to be made up of the following components: 1 or 2 days of the first stage of the original patient, 12 days before the mosquito becomes pathogenic, 3 or 4 days of incubation in the secondary patient after being bitten, a minimum total of 17 or 18 days.

Naturalists have discovered that the mosquito possesses salivary and poison glands, with a special duct opening into the proboscis, and that just before and while sucking blood, ejects an irritating secretion into the puncture, probably for the purpose of rendering the blood more liquid and absorbable. These salivary glands and duct then must be the channel through which the mosquito conveys the pathogenic germ while biting its victim. Are we to assume that when the Stegomyia mosquito has sucked infected blood it takes 12 days for the germ to be absorbed and carried by the general circulation to the salivary glands? This is against analogy and probability. It seems more reasonable to suppose that the germ undergoes a cycle of changes necessary to its reproduction and perpetuation; thus we know that, in malaria, the protozoan absorbed by the mosquito from a malarial patient undergoes certain metamorphoses which seem to insure its fecundation and reproduction.

The mosquito being once infected remains so, in all probability, to the end of its life, with the power of infecting an unlimited number of patients; thus, one is on record as having bitten a non-immune and produced yellow fever on the 59th day from its infection.

That an infected female transmits the germ to its progeny, through the eggs and larvae, is not in itself probable; there is nothing in the experience of the sanitary medical officers in Havana to give ground to such hypothesis, and Guiteras has shown by direct experiment that the offspring of an infected mother are completely innocuous.

What is the nature of the poison of yellow fever? The germ, contagium or poisonous principle of this disease has not yet been found, and its nature and character remain unknown. The bacillus of Sanarelli has been proved to be nothing but a product of decomposition, a fact now admitted by Sanarelli himself. That the germ exists in the blood has been proved by Reed, Carroll and Agramonte who produced six cases of yellow fever by the direct inoculation of infected blood from patients to non-immunes; and yet, cultures from the same blood made by these expert bacteriologists have failed to show bacteria or organisms of any kind. The thought naturally suggested itself that the contagium was ultra-microscopic, beyond the ken of our most powerful instruments. To prove this, Dr. Carroll drew blood from a yellow fever patient, let it coagulate, and pipetting out the serum, filtered it slowly through a new Berkefeld laboratory filter previously sterilized. This filter prevents the passage of the smallest known bacteria. In order to prove that his filtrate from the serum was bacteria-free, Dr. Carroll, after again sterilizing the filter, passed through it a recent bouillon culture of staphylococcus pyogenes aureus and, from the filtrate, was unable to obtain any growth of that bacterium in flasks of bouillon incubated at 37° C.

Dr. Carroll injected 3 non-immune American soldiers with this bacteria-free serum, and two of them had a typical attack of yellow fever after an incubative period of four days. It is therefore proven that the contagium of yellow fever exists in the blood, in the serum as well as in the cells; that it is ultra-microscopic and that until the power of our instruments has been greatly magnified all search for it will be futile. In that respect it is analogous to the contagium of the

foot and mouth disease of cattle and that of several common specific diseases such as small-pox, scarlet fever and measles. It may be a virulent toxine held in solution, or else an exceedingly minute organism. There are symptoms which suggest a toxine, but stronger reasons in favor of an organism which, however, may itself secrete a toxine; some of these reasons are the following: 1st. It seems hardly possible that a toxine absorbed by the Stegomyia from a yellow fever patient would require 12 or more days to reach the proboscis of the insect, or that, in the case of Culex mosquitoes, it should not reach the salivary glands at all. 2d. Reed and Carroll have shown that blood heated for 10 minutes at a temperature of 55° Cent. loses its infectious principle; now toxines are not known to be affected by such low temperature, while bacteria are much more sensitive. 3rd. The same experimenters succeeded in infecting a non-immune with the blood of one of the cases produced by the inoculation of filtered serum, and they contend that a toxine which has undergone such great dilution in the body of the second individual would be incapable of producing the disease.

That the mosquito is the intermediate host of the specific contagium of yellow fever must be admitted, but it is still claimed by many that the bite of that insect is not the only means of transmitting the disease. We have all been taught that the infection of yellow fever is in the air, that it proceeds from the body of the patient and clings to his bedding and clothing, his room and all objects contained therein, and abundant observations have been, and are still, adduced to prove this contention. Errors inculcated by generations of teachers are deeply implanted and not easily shaken. To uproot them requires violence to old prejudices, much determination and perseverance. It is the privilege of this Congress to clear the field of much rubbish by its official recognition of what is established truth and repudiation of exploded beliefs, the unhealthy growth of popular ideas uncontrolled by scientific experiment.

The experiments of the yellow fever commission at Que-

mados in 1900 and 1901 proved most conclusively that fomites, that is the clothing and bedding of patients, are absolutely harmless and incapable of infecting anybody. Seven non-immunes (Spaniards and Americans) were kept for several weeks in a room littered with most foul fomites, dressed in the very clothing, sleeping in the very sheets and beds of deceased patients, and came out of the ordeal in perfect health. One of them was subsequently bitten by an infected mosquito and promptly developed yellow fever, thus proving his previous non-immunity.

As this question was one of great importance, Major Gorgas, Dr. Ross and myself thought wise to continue the same line of experiments at Las Animas Hospital, not to verify those of the commission which carried conviction in themselves, but in order to give all physicians in Havana an opportunity to see and convince themselves. To that end, invitations were sent to all the prominent members of the profession to visit Las Animas and watch the experiments which were carried on, under the able direction of Dr. Ross and Dr. Biada, from Sept. 27th until Nov. 5th, 1901. Two non-immunes at a time were kept in the experimental room for a week, until four sets of 2 men, or 8 men in all, were thus subjected to the supposed infection. In the experimental room was brought, at various times, a large quantity of dirty clothing and bedding proceeding from the yellow fever camp at Columbia Barracks, 2 cases treated at "La Benefica," one of which died, and from another fatal case treated at Las Animas, the diagnosis in each of these cases having been established by the official commission. The eight non-immunes, subjects of these experiments, preserved excellent health while in the infected room and during the time (at least a week) they were kept under observation afterward. It is then clear that evidence of the most conclusive kind exists that yellow fever is not communicated by fomites, evidence which must now be accepted by all candid inquirers after truth. All those observations which connect outbreaks of yellow fever with infected clothing or baggage, if reconsidered in the light of our pres-

ent knowledge, will be found, if correctly recorded, to be always reconcilable with the doctrine of mosquito transmission. When we reflect on the length of time (six to eight or more weeks) pathogenic mosquitoes may live, and how difficult it is to diagnose a very mild case of fever which may unsuspectingly infect a new set of mosquitoes, many obscure cases of yellow fever on land or sea cease to be unintelligible and inexplicable.

PREVENTION.

Now we are prepared to consider the more practical and useful aspect of our subject, namely the prevention of yellow fever. Very naturally this is best accomplished by the destruction of the agent of transmission; let us destroy the Stegomyia and yellow fever will disappear as surely as does malarial fever upon the killing of the Anopheles; indeed, more surely, since malarial fever may recur in a once infected person without new poisoning by the insect. The extermination of mosquitoes, or of any one species in any locality, is difficult, well nigh impossible. These insects have means of perpetuating themselves until recently but little suspected and which give them great advantages in the struggle for life. These means are: 1st. Hybernation, whereby, at least in warm and temperate countries, full grown mosquitoes, especially fertilized females, live through the winter in sheltered nooks and corners; it is hard to understand how these fragile insects can survive the winter of the arctic circle where they swarm during the brief summer; it is probable that there they are more dependent on the next two means for their perpetuation. 2nd. The hybernation of larvae in ice, whereby larvae frozen in ice retain their vitality for an indefinite time and, on thawing out, go on to their complete development. 3d. The wonderful vitality of the eggs which resist the droughts of tropical climates as well as the long winters of northern countries, in both cases hatching successfully as soon as brought under favorable conditions.

These natural means of preservation show how difficult it is to exterminate mosquitoes; but if we bear in mind that

they cannot breed or live away from water, much can be done to reduce their numbers by the drying of all stagnant pools or the application of a thin film of oil on the surface of waters which cannot be drained. If a general fight against mosquitoes is thus waged, especially in towns, it will almost certainly strike the *Stegomyia fasciata* which is one of the most vulnerable.

Still more efficacious than the attempt to destroy the *Stegomyia* is to prevent it from becoming infected; unless it has sucked the blood of a yellow fever patient it is just as harmless as any *Culex*; therefore one of the measures most clearly pointed out is to prevent mosquitoes from having access to patients by protecting the latter with window screens and mosquito bars. Any patient thus protected during the infectious stage (first 4 days) is entirely innocuous; the only danger is from the mosquitoes which bit him, and other infected mosquitoes, still lingering in the room or adjoining apartments. Therefore fumigation is always necessary as soon as the patient is able to leave his room; this fumigation should comprise not only the patient's house but also extend to the immediately adjoining buildings so as to reach all mosquitoes which infected, or were infected by, the patient. This is based on the principle that each house breeds its own mosquitoes and that these seldom fly far away. For reasons already stated, if a patient is moved away after the 4th day of the disease from the place where he contracted it, the house he is taken to need not be fumigated.

Taking the word infection in its ordinary sense we now know that it is impossible for any house to be infected with yellow fever; it may harbour infected mosquitoes but, these once driven out or destroyed, it remains entirely free from the contagium of the disease. Therefore whenever, in this paper, a house, ship or place is spoken of as "infected," it simply means that said house, ship or place contains infected or pathogenic mosquitoes, only that and nothing else. If there is no infection there need be no disinfection; all that is required is the destruction of the intermediate host, *Stegomyia fasciata*.

and this is best effected by fumigation, either with sulphur fumes, formaldehyde gas or the smoke of Pyrethrum powder. That this fumigation is all that is required has been demonstrated in the city of Havana where, during the past year, all houses having yellow fever cases were chiefly treated with the smoke of Pyrethrum powder, the result being that, in hardly any, did secondary cases occur. It is exceedingly improbable that such smoke could kill bacteria or destroy any form of specific infection; its action therefore must have been entirely upon infected mosquitoes. To conclude this part of my subject, I think I am justified in saying that the disappearance of yellow fever from Havana is due to the incessant battle of the chief sanitary officer and assistants against the *Stegomyia fasciata* and the use of effective screens around patients.

QUARANTINE REGULATIONS. —

Not only has the discovery of the agency of the mosquito in transmitting yellow fever called for radical changes in the prevention and treatment of the disease, but it must also revolutionize the quarantine measures intended to exclude it. The subject of quarantine is one of especial interest to this Congress, since it is of such vital importance to the commerce of the various countries represented by its members. It will doubtless be discussed by other writers, but it seems desirable that it should be considered from all points of view, by as many members as possible, in order that this Congress may be enabled to take such official action and pass such resolutions as are demanded by the present status of sanitary science, the interest of public health and the needs of commerce.

Quarantine measures are necessary at the port of departure as well as at the port of arrival; at the port of departure so as to exclude the infection from shipboard; at the port of arrival, to prevent any infection which may exist on shipboard from spreading on land.

MEASURES AT THE PORT OF DEPARTURE.

To keep yellow fever from shipboard, two things are required: 1st, to exclude infected mosquitoes, 2d, to exclude

persons in the incubative period of the disease, that is, persons who have been infected less than five days previous to their embarkation. It is generally impossible to determine whether non-immune passengers have been so exposed as to make it probable that they are infected; even if living in an infected locality they may have been thoroughly protected by screens or mosquito bars. Therefore this matter must be left largely to the judgment and discretion of local quarantine officers rather than be regulated by some central authority having no knowledge of local conditions and circumstances. The only certain way to exclude all infected passengers (within the incubative period) would be to keep them under observation for five days before embarking, a very irksome measure, involving much loss of time and money and only to be employed in extreme cases. The aim of modern quarantine is to render intercourse between nations as easy and inexpensive as possible. I see no serious reason for not embarking all non-immunes, whatever the exposure may have been, who at the time of embarkation have none of the preliminary symptoms of the fever. It is so easy to prevent the propagation of the disease on shipboard where, as a very general rule, *Stegomyia fasciata* is absent, that the breaking out of one or even several cases is of no serious import; they can be isolated and screened with the absolute certainty that no secondary cases will result from them.

The exclusion of mosquitoes from ships is practically impossible if the latter load alongside wharves, but comparatively easy if they load by means of lighters in mid-stream; in this case the danger of harboring infected mosquitoes is very small, in fact a negligible quantity. The belief, tenaciously held that, in an infected port, yellow fever is particularly rife along wharves was evidently based upon the other erroneous and exploded belief that it was a filth disease and that wherever the air is filled with the odorous emanations of decayed animal and vegetable matter, there, necessarily, thronged and multiplied the dreaded germ. We have learned better; we now know that yellow fever is found chiefly in

dwelling-houses and that wharves are comparatively free from pathogenic mosquitoes. However, there are exceptions to all rules and wharves may be so situated as to be easily infected. As a practical rule for our guidance, in case of ships loading alongside wharves in an infected town, I would suggest that, after loading, they be required to cast loose and anchor at some distance from the shore, there to be inspected by an authorized quarantine officer who, after examination, will decide whether fumigation is necessary and, if so, in what parts of the ship. This fumigation, as we know, can be accomplished in a few hours without detriment to property or serious hardship to anyone.

MEASURES AT THE PORT OF ARRIVAL.

All ships arriving from non-infected ports, although these may be within the epidemic zone of yellow fever, should not be subjected to any detention; in this manner would successful measures of sanitation in any country be recognized, appreciated and made profitable.

Any ship which arrives from an infected port after a voyage of five or more days without any case of fever may also be released without detention provided no *Stegomyia fasciata* are found on board. In such case, great care will be required to ascertain that all the non-immune passengers are entirely free from fever by taking the temperature of each one. We know that cases of yellow fever may be so mild that even the patients do not realize they are ill until their temperature is taken; from such ambulant cases the spread of the disease is most to be apprehended.

When a ship arrives with yellow fever patients aboard, several possibilities suggest themselves. If all these patients developed the disease within five days after sailing, it may be assumed that they contracted it before coming aboard and that the ship is probably free from infected mosquitoes. If one or more patients developed the disease after five days, it is almost certain, and after six days absolutely certain, that the infection occurred after sailing and that pathogenic mosquitoes are present on shipboard. In either case the patients

should be landed and isolated, and the forecastle and cabins fumigated. The well non-immune passengers may, in the first case, be discharged upon the completion of the period of five days from the date of departure, provided the presence of *Stegomyia fasciata* can be reasonably excluded; but, in the second case, they must be held for five days from the time they leave the ship.

As to the ship's cargo, the conviction seems to be growing among sanitarians that it is incapable of conveying any kind of infection, and that its disinfection for any disease is very seldom called for. In yellow fever, however, the treatment of the cargo must be based on special principles. If the ship was loaded alongside a wharf in the vicinity of infected houses, and made the trip in 3 or 4 days, or less, there seems to be no reason why the hold could not harbour infected mosquitoes and, in my opinion, should be fumigated, as well as the forecastle and cabins, unless this measure has already been taken at the port of departure or during the trip. It is held by Reed, Carroll and other experimenters that the *Stegomyia fasciata* cannot live more than 3 or 4 days without water and that in any voyage lasting 4 or more days, no mosquito of that species will be found alive in the hold of the ship (if dry) or in the baggage of passengers. Therefore they contend, with much logic, that under these circumstances any fumigation is entirely unnecessary. On the other hand, I have been informed by a trustworthy medical officer that on opening his trunk in New York, ten days after closing it in Cuba, he saw three mosquitoes fly out of it. Perhaps they were not *Stegomyia* and belonged to a more hardy species. However it may be, this matter of the longevity of mosquitoes in confinement, without water, is very important and should be conclusively settled. Fortunately it is of very easy demonstration and need not materially retard the enforcement of the new measures which must soon be inaugurated.

A VACCINATION LESSON OF THE LATE CIVIL WAR,
DURING THE SIEGE OF CHARLESTON, S. C.*

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LATE SURGEON UNITED STATES ARMY.

IN THE Autumn of 1862 small pox broke out in Norfolk, Va., and assumed such proportions that the late Henry A. Martin, M. D., of Roxbury, Mass., was employed to superintend vaccination of the soldiers and civilians of Norfolk and vicinity. Dr. Martin is the best recognized authority on vaccination that the century has produced since Jenner, and was the first to introduce animal vaccine into America. Under his supervision the epidemic soon ceased.

During the winter of 1863 and 1864 we had about 1500 infantry, more or less actively engaged in the siege of Charleston, S. C. Not a case of small pox had occurred on the island. Under my supervision at this time was the First Regiment of North Carolina Volunteers, afterwards known as the 35th U. S. Colored Troops, James C. Beecher, Colonel. When the regiment was ordered to the siege of Charleston, a detachment remained in Norfolk. These men numbering 110 under the charge of an officer were sent, January 31st, on a small sailing vessel to rejoin their regiment on the island. En route one man died, and no report was made, since there was no medical attendant on board. These men seemed well on arrival, save the discomfort of the rather long, tedious winter voyage. They were at once consigned to their respective companies without any special examination.

February 8th one of these men reported at sick call, a serious sufferer with headache, backache, fever, etc.; no eruption and no thought of smallpox. Of this detachment, by noon the

*Read before the Commandery of the Loyal Legion, at Boston, February 4, 1902; publication requested by unanimous vote.

following day, 15 men were taken very ill. A careful study of these cases caused me to become assured that they were ill with smallpox. I then learned for the first time that the man who died en route had been taken in a similar way and was broken out with an eruption before his death, hence, all too clearly was the evidence of a like exposure of all this detachment of men.

"What was to be done?" The news had spread like wildfire through the entire command, and a panic, almost approaching insubordination, ensued. Receiving from my Brigade Commander full authority, I at once established an isolated camp and removed every man belonging to the detachment into it. I set up an ample number of hospital tents and detailed a medical officer to take charge of these.

Dr. DeGrasse of Boston, my efficient assistant, and myself carried the sick men on stretchers and placed them on beds prepared for their reception. This we were obliged to do personally as not a soldier could be induced to touch the sick. My next duty was to look for vaccine virus. I found I had a few crusts put up in wax and issued by the medical department, but these, at the best, I knew were of small value. A number of men protested that they should not be required to enter the isolated camp, as they had recently been vaccinated at Norfolk; and in attestation showed me their arms still sore and, fortunately, carrying large crusts, demonstrating the value of their vaccination. Joyfully I accepted these as a godsend of protection, carefully made them into a thin paste with glycerine, and Dr. DeGrasse and I began our work of vaccination, commencing with ourselves. All night long the dusky procession passed in bare-armed review, and before noon the next day the eight hundred men of the regiment had been carefully vaccinated by us. Weary to exhaustion we at last sought rest.

Then came the cleaning of camp, to which every one gave eager aid, and in another day we were undoubtedly the cleanest regiment on the island. The one man hardest to control was the Assistant Surgeon, detailed in charge of the isolated camp. To my astonishment he coolly walked into my

quarters the following day and demanded to be relieved of this irksome task. The return to his post of duty was made emphatic with the added instruction that the patrol was ordered to halt, and, if not obeyed, to shoot the man who attempted to leave camp, and to this order there could be no exception. This was the last time I saw the poor fellow, who resigned his commission later in the year, but his requisitions were filled to the letter.

It is needless to say that the two weeks following were days of great anxiety. Careful inspection of arms and re-vaccinations were made the most important of daily duties. At last the dreaded period of danger was ended. Not a single soldier of over eight hundred thus exposed to the dread disease had even the slightest attack of varioloid, and when, some days later, we sailed away en route for an expedition to Florida, it is safe to believe that I was the happiest man in the entire command.

But what of the detachment left behind in the isolated camp? Out of a total of one hundred and ten men over eighty took the disease and forty deaths attested the virulence of the dread scourge which, with a singular fatality, for the centuries before Jenner, swept the civilized world.

It is probably not generally known that, during the regime of slavery, the owners, in most instances, deliberately preferred not to vaccinate their slaves, trusting to the security of isolation incident to plantation life.

I have made this hitherto unpublished contribution to medical military history, not solely because of its local interests, but more especially as a series of graphic facts which teach the value of protection derived from vaccination in a way that civil life could hardly render.

This generation has become so immunized from the severer forms of smallpox, because of vaccination that few, even of the medical profession, can now realize the precious boon which Jenner conferred upon the race. It is to such ignorance alone that can be attributed a prejudice against proper vaccination and the insistent attacks that have been made against its enforcement.

MILITARY HYGIENE IN THE TROPICS.

By CAPTAIN CHARLES EDWARD BELIN FLAGG,
ASSISTANT SURGEON IN THE UNITED STATES ARMY.

IN VIEW of the fact that a large part of army service will be tropical service, the question of how best to preserve the health of troops and individuals in the tropics, is of importance.

The subject will be discussed under the following divisions:

- A. Selection of men for service in the tropics.
- B. Prophylactic measures applicable before embarkation.
- C. Acclimatization; Diseases to be guarded against.
- D. Clothing.
- E. Food and water.
- F. Shelter and disposal of wastes.
- G. Work, recreation, habits, etc.

(A) *Selection of men for service in the tropics.*

According to existing regulations and customs of the service much discretion is left to regimental and company commanders as to the selection of men to be taken to the tropics and after the arrival of the organization at its destination the recruiting officer has the responsibility of choosing men to supply the places vacated by retirements, discharges and deaths.

The minimum age ¹for enlistment is fixed at 18 years. No minimum weight is prescribed for cavalry and light artillery and the maximum weight for infantry and heavy artillery is fixed at 190 pounds.

There is at present no maximum age limit for enlisted men for service in the tropics and officers over 60 are not debarred from active duties in the field.

Bearing in mind the exceptional physical and mental strain that our soldiers are likely to be subjected to in the tropics only those men most fit to endure such strain should be selected.

First as to age:² "The most effective armies are those in which the youngest soldiers have been over twenty-two years of age. At 18 the bones are not fully formed, nor do the muscles reach their mature growth much before twenty-five years; while thus undeveloped and immature, as they must be at eighteen years, it is useless to expect any long-continued exertion or energy from men at that age. If enlisted, the state should recognize this, and suit the work to their strength; at eighteen, recruits have not only to work, but to grow and develop, and they should have precisely the amount of exercise and kind of work best fitted for them."

If such an undeveloped boy is taken to a station within the United States where the climate and surroundings are not wholly unlike those to which he has been accustomed, the training to which he is there subjected will probably aid in his development. Should he be taken to the tropics, however, where his surroundings are entirely new, where the climate is not only enervating but frequently insalubrious, he will most probably be unable to endure the service required of him, especially if this service entails much night work, frequent marches in the sun and rain, and constant alertness and mental tension, such conditions as at present obtain in the Philippines.

Granted that the best work and greatest number of days of duty can be obtained from men over 20, there will still be many recruits under that age sent to the tropics as the recruiting officer must accept boys from 18 to 20 years old if they otherwise fulfill the legal requirements.

The following quotations from³ An Epitome of Trippler's Manual and Other Publications on the Examination of Recruits, has especial force in relation to tropical service. "Should a minor offer the written consent of parent or guardian, the question then presents itself whether so young a person possesses the vigor and physical development necessary for the performance of all the duties of a soldier.

"Youth, being the period of active growth for body and mind, should be passed under conditions that will secure to it the proper amount of food, exercise and rest, in order that its growth may be healthy. These cannot always be obtained in the military service, the exigencies of which may be such as to test to the utmost the endurance of the soldier when subjected to the hardships of extreme exertion, inclement weather, loss of rest, and privation of food incident to many campaigns. Under such circumstances the staying power of the immature youth is found wanting. His undeveloped body yields to the strain, and a consequent permanent disability leads to his discharge from the army. As all military experience confirms this, and as the opinion is almost universal that youths are not fit for the duty our soldiers are called upon to perform, their enlistment should be discouraged save in cases where their physical development is exceptionally good and they display a true aptitude for the military service."

Recruiting officers should be thoroughly familiar with this manual.

Under present conditions, the medical examining officer will frequently be more or less unfamiliar with the amount and character of the work required of the soldier, and when this is the case, the recruiting officer should not only be present at the examination, as required by Army Regulations, but by questions and suggestions impress upon the medical examiner the importance of his duties.

The following points require especial consideration:

(a) Diseases of the skin or a tendency thereto.

(b) Defective teeth. ⁴ "If several of the teeth are decayed, especially about the crown, it is probable that before the expiration of enlistment they will be so far destroyed as to render mastication imperfect; hence men who have lost the front teeth from decay and have many unsound back teeth should be rejected. The loss of the front teeth through accident is not cause for rejection, provided a sufficient number of the back teeth are sound.

Unless an applicant has at least four sound double teeth,

one above and one below on each side of the mouth, and so opposed as to serve the purpose for mastication, he should be rejected."

The question of proper mastication is not the only one to be considered in relation to the teeth; and as the loss of the teeth through decay sometimes denotes previous ill health it is a safe rule to reject applicants with artificial teeth.

(c) Relaxed or patulous inguinal rings, not ordinarily a cause of rejection, should as a rule debar from this service.

(d) Hemorrhoids of any kind, should be a cause for rejection.

(e) Varicocele of any degree should reject.

(f) Varicose veins sufficiently large to be noticed should be cause for rejection.

(g) Deformed and defective feet, including overriding toes, corns if at all severe, ingrowing nail, and bromidrosis or stinking, sweating of the feet should reject. Besides this care in the selection of recruits especial precautions should be taken to exclude from this service all old soldiers who are unfit.

On the receipt of the order for service in the tropics the surgeon should be required to make a thorough examination of the command and to report all men considered unfit for tropical service with his reason, in each case, for considering them unfit.

While some maximum age limit should be fixed for tropical service this limit might well be exceeded in the case of general officers and on the other hand some soldiers will be found, who, although younger in years than the maximum age limit prescribed, are histologically and therefore physiologically older than the limit. It is said that a man is as old as his arteries and it is frequently found that the changes in the tissues, normal to advanced age, have occurred at an earlier period than is usual.

What this age limit should be, I will not attempt to state, although I am inclined to believe it should be between 45 and 50, certainly not over 50.

For French soldiers⁵ the "inferior" age limit has been fixed by Burot and Legrand at 22 and this, they state, is the inferior age limit for soldiers sent to the tropics by the English, Spaniards and Dutch.

These authors consider 40 as an extreme maximum for privates in the tropics.

It would be better if the surgeon who is to examine the troops before embarkation had served for some time previously, with them, and, in any case, the medical history of the soldier, as obtained from the records and from the statements of the man, should be considered.

The men found incapacitated could be disposed of as their cases demand, being discharged on Surgeon's Certificate of Disability, transferred to home battalions and squadrons, etc.

The question of the proper disposition of noncommissioned officers and veteran privates too old for service in the tropics must be considered sooner or later by Congress, and the sooner such action is taken the sooner will the sick and death lists in the tropics be reduced. Noncommissioned officers are now transferred to home battalions without reduction and this is a step in the right direction.

Having carefully excluded all men unfit, or likely soon to become unfit, for this service, the next points to be considered are:

(B) *Prophylactic measures applicable before embarkation.*

The precautions now ordered to be taken to guard against smallpox would seem to be sufficient, and if the existing orders on the subject are faithfully and intelligently carried out, nothing more can be done to guard the command against this disease.

The men are first examined at their home stations by medical officers and those not already protected by a recent successful vaccination are vaccinated. This examination and vaccination is repeated at the port of embarkation, possibly on the voyage, and after arrival at the port of debarkation. In the Division of the Philippines, G. O. 31, Hdqrs. Dept. of the Pacific and 8th A. C., Manila, P. I., November 19, 1898,

requires that each enlisted man not successfully vaccinated within the preceding six months be vaccinated and if this vaccination prove unsuccessful that the operation be repeated at intervals of two weeks as often as necessary, in the judgement of the surgeon, to protect against smallpox; and if unsuccessful, at least three vaccinations in succession must be made before the soldier should be considered protected.

Protective inoculation against typhoid fever has been practiced with some success in the British army but has not as yet been adopted in our army.

Protective inoculation against yellow fever is, it is hoped, to be looked forward to as a measure of utility, but is not now generally accepted as an assured fact. Protective inoculation against bubonic plague would probably be made in troops sent to infected localities, as this measure is no longer in the experimental stage.

The subject of venereal disease deserves some notice although with the excellent hospital facilities of our transports these cases fare better than formerly when some of the ships hired as transports furnished not only poor hospital facilities but also insufficient cubic space per well man. However it is advisable to prevent venereal contagion as much as possible, for the good of the soldier en route as well as when he experiences the enervating conditions in the tropics.

Seaports have, admittedly, a large percentage of venereal disease among prostitutes and the men should be warned of this danger and as much restriction placed upon them as the length of stay at the port renders admissible.

Instruction of the soldier in the avoidance of the lowest and dirtiest class of prostitutes, in temperance and personal cleanliness, would do much towards avoiding venereal disease. This instruction might be given in the form of a printed circular.

It is not uncommon to find the genitals of men admitted to hospital, in a filthy condition. Plain directions concerning this matter should be given to soldiers. They should be informed that secretions retained underneath the foreskin ren-

der the tissues peculiarly vulnerable to any infection with which they may come in contact, and that these parts should receive frequent washings in soap and water, the foreskin being retracted for the purpose.

Restriction and discretion in the granting of passes will also minimize the danger of the occurrence during the voyage, of other contagious diseases.

(C) *Acclimatization* has been a subject for much discussion and as intelligent treatment of the matter requires an intimate knowledge of the physiological reaction of the human machine to the most varying conditions, there is still a wide field for investigation along this line. Mark Twain's picture of the "Acclimatized Citizen" shows what acclimatization is not. The subject of the picture is a tall, lean, stooping figure, skin of a dark yellow hue, the enormous spleen forms an "ague cake" plainly to be seen enlarging the already distended abdomen, the eyes are haggard and the general expression is of one who gets hot but can't get warm, and cold but can't get cool, and is distressing in the extreme. Acclimatization is not an acquired resistance to endemic disease but is rather an adaptation of the economy to altered climatic conditions. This and nothing more.

One method of acclimatization is in accordance with the Darwinian law of survival of the fittest. All the members of the community not capable of enduring the climate die in time and the survivors will then form an acclimatized class. This method need not be considered at this time in connection with our army of occupation.

According to Notter and Firth⁶ "From the results of a long extended inquiry into the effects of climate on different races of people, Stokvis concludes that the power of resistance of the healthy adult European living in the tropics quite equals, and in some measure is even superior to the vital power of the native races. On the other hand, there are certain peculiarities of the race which have been gradually acquired by inheritance from generation to generation and that the longer the European resides in the tropics the more likely is he to lose

his superior resisting powers; and it is possible that the European creole is both bodily and mentally inferior to the European."

It is then seen that residence in the tropics does not induce immunity against so called tropical diseases, and it has been found that the functional changes that take place, as for instance, increased action of the skin and diminished activity of the lungs, are readily and rapidly accomplished, and that therefore, no preparatory residence in a warm climate is required. It would, however, perhaps be unwise to send troops directly from Alaska or extremely cold stations to the tropics.

The Diseases to be Guarded Against are: malarial fevers, dysentery, diarrhea, insolation and calor morbus, typhoid fever, leprosy, skin diseases and intestinal parasites, yellow fever, and bubonic plague.

Malaria is caused by the introduction into the body of the malarial organism, the plasmodium malariae. A frequent and possibly the exclusive method of introduction of this organism into the system is by the bite of a mosquito that has previously bitten a malarial patient. It is to be noted that infection of the mosquito from a malarial patient is necessary to enable it to transmit the disease, and, further, that only certain species of mosquitoes are capable of nurturing and transmitting the plasmodium.

The predisposing causes of this disease are the conditions favorable to the growth and propagation of the mosquito, and all causes tending to depress the vitality of the body, notably chilling.

According to our present knowledge of this disease the most universally applicable measure for its prevention is the absolute protection from mosquitoes. That this measure is both feasible and effective has been demonstrated beyond

NOTE.—In the discussion of the paper Contract Surgeon Scherrer, U.S.A., remarked on the efficacy of the application of coal oil or crude petroleum to the surface of ponds and other bodies of stagnant water in preventing the hatching of the ova of mosquitoes, one of the most important features of prophylaxis known at the present time.

question of doubt. Exclusion of mosquitoes in barrack will be discussed later on. Protection against mosquitoes outside of habitations during the day is scarcely needed as the mosquitoes to be avoided are nocturnal in their habits. Protection of men on guard and other duty during the night may be secured in some degree by having the hands covered and by allowing a growth of the beard to protect the face. The exposed portions of the face may be smeared with oil containing pennyroyal, lavender or some such substance repugnant to the mosquito. One half gram (eight grains) of quinine taken every second day will ward off attacks of fever in most instances but is only to be recommended where protection from the mosquito can not be secured. The habitual use of quinine has a deleterious action on the system.

Dysentery is caused by the amoeba dysenteriae, by bacteria and possibly by the effects of cold, in chilling the body, without the agency of bacteria or amoebae.

The pathogenic bacteria and amoebae are ingested with the food and water and possibly with dust. Flies spread the contagion.

Prophylaxis consists in care in preparing and serving food, in avoiding contaminated water, chilling of the body and uncleanliness.

Diarrhea is a symptom of many diseases and is frequently caused in the tropics by the ingestion of improper food, by depression and relaxation of the system by prolonged heat and by chilling of the body.

Insolation, sunstroke or heatstroke is due to the effect of moist heat, and calor morbus, heat sickness or heat exhaustion is due to a usually more prolonged and perhaps less violent action of the same causes.

Prophylaxis is to be procured by proper clothing and exercise.

Typhoid fever is not peculiar to the tropics, as every one knows, but occasionally it becomes very virulent among troops serving there.

The same prophylactic measures applicable everywhere else for this disease are also applicable in the tropics.

Leprosy deserves attention in connection with the fact, known and recorded, in the time of the ancient sanitarian, Moses, and since many times confirmed, that a house may become infected by residence therein of a case of the disease. It resembles in this respect, tuberculosis.

The etiological factor is the bacillus *leprae* and the disease is transmitted rather by prolonged contact with infective material than by a single short exposure.

Skin diseases of various kinds are troublesome in the tropics.

The increased action of the skin renders it extremely susceptible to irritation from insects and ascomycetes, and the skin having become injured by these causes is frequently attacked by ubiquitous bacteria.

Furuncles or boils, phlegmon, carbuncle, oriental sore or tropical ulcers; and grave general infections may then occur.

Dhobie or washerman's itch caused by the trichophyton and other fungi, is annoying in the extreme, and pemphigus, characterized by a bullous eruption, is also frequently encountered.

An enumeration of all the skin diseases met with in the tropics is not within the scope of this paper.

Prophylaxis consists in especial care of the skin, particularly in regard to cleanliness. The clothing must be suitable and while being cool must thoroughly protect the skin.

Clothes must frequently be washed and boiled, and this holds good for all clothing coming into contact directly or indirectly with the body; bedclothing and outside clothing as well as underclothing.

The intestinal parasites of the United States and some others are found in abundance, and the greatest cleanliness is therefore necessary in the preparation of food eaten raw.

NOTE.—Since writing the paper I have seen a report of 1st Lieut. Richard P. Strong, Asst. Surgeon, U.S.A., mentioning the presence of ankylostomiasis in the Philippines. Quite a number of cases have since been reported in the United States.

The ankylostomum duodenale, first found to be the cause of serious disease in laborers in the construction of the St. Gothard tunnel, is found to be widely disseminated in Porto Rico and may be present in Cuba and the Philippines. These parasites attach themselves to the lining membrane of the duodenum, the upper part of the intestinal tract, and produce a grave degree of anemia in their host.

Dogs are frequently carriers of the ova of intestinal parasites and transmit them to man by licking his hands or clothing; or the ova may be deposited on the hair of dogs by licking and then to the hands and mouths of men caressing the dogs.

The prophylactic measures to be observed against yellow fever *are well known and it is hardly within the scope of this paper to discuss its etiology or the value of prophylactic inoculation of serum.

Bubonic plague is caused by the bacillus pestis which gains entrance to the system through abrasions of the skin, usually of the feet of bare-footed natives, and of the hands of others. It is possible that infection may also take place through the respiratory tract. The role of rats in the spread of the disease has been widely discussed and it is believed that the fleas on the infected rats take an active part in disseminating the plague.

(D) The *Clothing* now furnished soldiers for service in the tropics is, on the whole, well adapted for the purpose.

It is conceded that in the tropics the body of the soldier must be thoroughly protected but must not be warmly clad. The clothing must be light. Under no circumstances should soldiers be permitted to discard any part of their underclothing as they are essential for the protection of the body.

The value of the abdominal bandage has been demonstrated, and it should consist largely of wool.

From personal experience and observation I am of the opinion that a modification of the heavy blue flannel shirt

*The discovery of the transmission of the disease by mosquitoes (*Stegomyia fasciata*) and as fully discussed in the article by Col. Havard in this issue of the JOURNAL, was made after the preparation of this paper.

now issued, if worn during the night as well as during the day, or at some stations, only during the night, will take the place of the abdominal bandage and prove as effective as the bandage in preventing chilling of the abdominal organs and consequent intestinal troubles. The light weight blue flannel shirt now issued may be satisfactory for this purpose. I have not seen the shirt. The tails of the heavy weight shirt need to be at least four inches longer thoroughly to protect the abdomen.

If worn as an outer garment the color of this shirt makes the wearer conspicuous and therefore more or less unhygienic in an engagement.

The attempts to secure a suitable sweat-proof khaki-colored dye for woolen material have not as yet, so far as I know, been crowned with success.

The thin sleeveless cotton undershirt and thin cotton drawers are suitable for tropical wear.

The shoes should fit the feet and should be soft and pliable. A tan shoe of excellent quality has been issued, but, in my opinion, the problem of properly fitting the feet has yet to be solved.

The best type of head dress is a light, ventilated, cork, straw, or pith, helmet that sits easily but securely on the head and affords protection to the eyes and nape of the neck. During active operations the cork helmets issued to our troops have been found to have their disadvantages, and the men, if given their choice, will select the soft campaign hat in place of the stiff and cumbersome helmets. Protection of the head from the heat of the sun is so essential to health in the tropics that the head dress that best subserves this purpose must be selected, and the campaign hat, well tried and serviceable though it is in temperate climates, must, to a large extent, be, in the tropics, displaced by the helmet.

The color of the clothing should be such as to absorb as few heat rays as possible. Therefore white is preferable and when military necessity contraindicates this our khaki is next best.

No portion of the uniform should constrict the body at any point and when soldiers are seen buttoning up their blouses on the approach of an officer it may be known that the blouses are uncomfortable or too tight. This is true in any climate, but the results of tight clothing will be most harmful in a hot climate. The care of the clothing requires attention. No part of the clothing worn during the day should be worn at night and the underclothing should be laundered at least twice a week. It is important that the clothing be boiled when washed and in this manner sterilized. The native washers will not do this unless required to.

Dhobie itch, already alluded to, is very annoying and persistent, especially when attacking the skin of the crotch, and may be prevented or its cure favored by a daily change of short cotton bathing drawers. The wearing of unboiled underclothes and wearing the same suit of underclothes any length of time without having them washed conduces to the disease.

(E) *Food and Water*.—The ration as issued and cooked in this country is not suitable for the soldier in the tropics, and this has been demonstrated by experience and by a board of officers and scientific deduction.

As the President now has control of the amount and components of the ration a suitable tropical ration will no doubt be issued.

There are still some points to be considered about this question of food.

The greatest care must be exercised in the storing, handling, cooking and serving of food. Where it is impracticable to secure beef on the hoof, refrigerated beef will be found as nutritious and digestible and only slightly less good in keeping qualities, after thawing, than fresh beef. Where abundance of ice is not procurable meat should not be kept for any length of time, and hashes, ragouts, etc., should not be made of left over scraps of cooked meat. All food and meat especially, must be carefully protected from the flies before being cooked, during cooking and while being served.

The ideal ration as given by Munson⁷ is as follows:

ARTICLES.	QUANTITY PER RATION (ounces).	PROTEIN, gm.	NITROGEN, gm.	FATS, gm.	CARBOHYDRATES, gm.	FUEL VALUE CALORIES.
Fresh Beef (quarters).....	10.0	41.68	6.67	44.75	.....	590
or Fresh Mutton.....	10.0	46.20	7.35	62.90	.....	720
or Pork	6.0	27.54	4.40	112.54	.....	1093
or Bacon	6.0	15.64	2.49	105.06	.....	1012
or Salt Beef	10.0	40.27	6.44	64.68	.....	688
or Dried Fish (cod)	10.0	45.37	7.26	1.13	.....	197
or Fresh Fish, average (whole)	14.0	31.73	5.07	0.79	.....	120
Flour	18.0	55.08	7.90	5.60	380.46	1850
or Soft Bread.....	20.0	53.83	8.61	6.80	299.20	1506
or Hard Bread.....	18.0	73.12	11.74	6.63	371.81	1926
or Corn Meal.....	20.0	50.40	7.99	12.40	425.80	1986
Beans	2.4	15.16	2.42	1.22	40.18	210
or Peas.....	2.4	16.38	2.62	0.75	41.80	246
or Rice	4.0	8.75	1.40	0.45	88.87	407
or Hominy	4.0	9.20	1.47	0.67	88.75	430
Potatoes	16.0	9.50	1.52	0.45	81.70	380
or Potatoes 80% & Onions 20%	16.0	8.60	1.40	0.72	73.09	340
or Potatoes 70% and Canned Tomatoes 30%	16.0	8.17	1.36	0.54	65.80	297
Dried Fruit, average	3.0	1.77	0.27	1.53	35.80	220
Sugar	3.5	.....	.....	.....	94.25	397
or Molasses	1 gill	.....	.....	.....	56.05	269
or Cane Syrup	1 gill	.....	.....	.....	56.25	269
Coffee, green	1.6	.....	.....	.....	.....	.....
or Coffee, roasted	1.28	.....	.....	.....	.....	.....
or Tea, green or black	0.32	.....	.....	.....	.....	.....
Vinegar .....	.32 gill	.....	.....	.....	.....	.....
Salt .....	.615 oz.	.....	.....	.....	.....	.....
Pepper, black .....	.04 oz.	.....	.....	.....	.....	.....
Soap .....	.64 oz.	.....	.....	.....	.....	.....
Candles .....	.24 oz.	.....	.....	.....	.....	.....

This, it will be seen, differs from the ration as heretofore issued in a slight increase in sugars and starches and a reduction in nitrogenous and fatty matters.

For an exhaustive scientific discussion of this question the prize essay of Munson may be consulted⁸ or "The Theory and Practice of Military Hygiene" by the same author.

Bacon should be packed in salt before shipment to the tropics as even well cured bacon, if not so packed, is apt to become rancid. I saw this demonstrated in Luzon. Bacon from the United States of a fine quality and well cured, sent in sacks, became rancid after being kept a time in Manila while the Australian bacon packed in boxes between layers of salt kept indefinitely.

Fresh fish will prove an excellent occasional substitute for beef but the fish must be absolutely fresh and preferably alive when turned over to the cooks.

Flour should be furnished in hermetically sealed packages and if it becomes damp before use it should be dried at a temperature of 100° F to 110° F. If any portion becomes sour this should carefully be separated and discarded. Bread should be carefully protected from dust and germs and should preferably be handled by means of clean gloves rather than with bare hands.

Beans require most thorough cooking and are rather difficult of digestion. They should be served only occasionally and preferably in the form of thick soup with the bean hulls strained out. Peas, like beans, and for the same reason, should not form a constant article of diet. The other substitutes for beans, hominy and rice, are as a rule, not so well liked by the men. As this is largely a matter of habit it may be corrected by attention to the cooking. Hominy should be thoroughly cooked and eaten with bacon or other meat, and rice should be cooked after the East Indian and Southern United States method and not like glue.

Besides, rice may be used to thicken soups and may be made up with tomatoes, okra and other vegetables in a variety of ways. Potatoes and onions should be carefully sorted and decaying ones discarded.

Dried fruit must be examined for worm punctures and shriveling and if shriveled or with worm punctures it should

be condemned. Dried fruit requires thorough cooking. Ripe fruit is not so deadly a poison in the tropics as is sometimes thought, and should replace the dried whenever practicable. Ripeness and soundness must be insisted on if fresh fruits are issued. Most scrupulous cleanliness of cooking and mess utensils, mess halls and surroundings must be enforced and flies rigidly excluded from all food and garbage.

Water for bathing, etc., has already been discussed. The necessity for pure drinking water is indicated by the water borne diseases. While it is the province of the medical officers to determine whether water to be supplied to troops is pure the line officer may, through force of circumstances, be obliged to do this himself.

The impurities in water are organic and inorganic. Sea water is a type of inorganically impure, and water containing the germs of disease of organically impure water. Practically no chemical tests are needed for detection of inorganic impurities as barring sea water itself and brackish water obtained in the vicinity of the sea, inorganically impure water is rare in comparison with organically impure. The physical qualities of potable water are too well known to require discussion in this paper. It may be noted, however, that the odor of impure water may be best detected by heating the water slightly in a nearly full corked bottle and agitating it. Hard water is water containing ten grains or more of CaCO_3 or its equivalent in the earthy bases or their salts, to the gallon. If excessively hard it may produce diarrhea. The test for hard water is the degree with which it forms a lather with soap, and by Clark's process, using a solution of soft soap in methylated spirit and water, standardized, the exact degree of hardness may be determined.

The most harmful organically impure water may be clear, sparkling, tasteless and odorless, and the only sure tests are the bacteriological, in which disease germs are detected in the water, or physiological in which people drinking the water remain well or contract disease. The latter is a costly method and the former can only be done by experts. If a

sample of water contains much organic matter living or dead it may be considered dangerous. There are several simple tests for organic matter. Twenty grams or nearly two tablespoonfuls of a concentrated solution of tannin may be added to a glassful of water. If the water becomes turbid in less than an hour it should be rejected. Another test is the addition of a few drops of a one to one thousand solution of permanganate of potassium to a glass of water and the pink tint produced should not disappear. The fact of the presence of an excess of chlorides in sewerage contaminated water is also made use of to determine its purity. This excess may be determined by the degree of white cloudiness or actual precipitate produced in the water on the addition of silver nitrate solution. A recently discovered color test for nitrates is recommended for its simplicity and accuracy. Messrs J. F. Schwarzlose Soehne, in Berlin, furnish a solution of sodium anilin-p-sulphonate containing hydrochloric acid and tablets of anidonaphtholdisulphonic acid. To make the test add one teaspoonful of the solution to a quarter of a tumberful of the water to be tested and ten minutes later a tablet. After standing for one hour if the tested specimen is light pink it shows a water that is not good, but which may be employed in case of necessity. If a rose-pink it shows a water unfit for drinking, and if a magenta it shows a water extremely dangerous to health.

Of the numerous methods of water purification it would seem that the most practical and effective for soldiers is boiling. Where properly distilled water can be procured it should be given the preference. Where this cannot be procured the harmful organic matter may be rendered harmless by boiling. The Waterhouse-Forbes sterilizer now in use in the army would seem to be the best practical appliance for sterilizing water. I have had no personal experience with it.

The advantages claimed for the sterilizer are efficiency, inexpensiveness in operation and portability. The water issuing from the sterilizer is said to be only $4\frac{1}{2}^{\circ}$ F. hotter than that entering it. A few points concerning sterilization of

water should be borne in mind. If heat is the method employed the water should actually be brought to a boil, not merely warmed. If water is boiled for any length of time its contained gases are driven off and the water left with the well known flat taste. This may be remedied by allowing the water to fall through holes in the bottom of a coal oil can and thus aerating the water. Boiled water does not remain sterile and unless flies and dust are excluded it may become more contaminated than it was before sterilization. Frequent dipping into water, especially when the dipper is used to drink from, is a common method of pollution of stored water. Sterilized water must be as cool, palatable and as easily procured as the natural water, otherwise instructions and orders concerning the exclusive use of sterile water will prove unavailing. Contaminated water is not sterilized by the addition of alcohol in any form or quantity.

(F) *Shelter and Disposal of Wastes:*

The shelter for our troops in the tropics has so far been mostly native buildings, previously constructed for various purposes. Palaces, theaters, churches, monasteries, barracks, hospitals, colleges, mills, private residences, hovels and stables have all given shelter for days, weeks and months, to troops to which I have been attached, and this shelter, imperfect, inadequate and positively unsanitary as it often was, is better than any tentage that could be supplied. If tents must be used the Munson Hospital Tent with ridge ventilation, dark colored walls, and overhanging fly, is the best type with which I am familiar. Tents, should, if possible, be pitched in the shade on platforms raised from the ground. One danger in the occupancy of native dwellings by troops is the possibility of infection with the germs of contagious diseases. The construction of these houses renders their disinfection by means short of destruction by fire, impossible. I know personally of natives with smallpox having been expelled from houses in which our troops immediately took up their abode, and I have good reason to believe that cases of leprosy previously occupied some of these same houses in

which we lived for two days. I have furthermore seen a record showing that our troops occupied yellow fever buildings—buildings infected by the presence of cases of the disease—in Cuba.

Occupancy of previously occupied native dwellings, then, must be accomplished with due regard to this danger of infection.

For temporary use, barracks of native design and material are easily and rapidly constructed with little cost and are fairly comfortable and sanitary. I have in mind the Filipino barracks at Tarlac which were in process of construction when the capital was occupied by our troops. The uprights, one end of which were buried in the ground, were of wood, and the remainder of the framework of bamboo. The shed and walls were of nepa. Along the walls, on the interior, raised some four feet from the ground was a bamboo platform about ten feet wide. This served as beds. The structure was roomy and the shed high. An adjoining shed served as cook house. Board structures may be used for temporary occupancy. The essentials are: floors must be as far as practicable from the ground, roofs must be high; air space must be ample—one thousand cubic feet per man is insufficient in the tropics and it is to be remembered that in computing air space, space above ten feet from the floor must be disregarded.

Ventilation should be ample and the native custom of having large and numerous windows, should be observed. For the prevention of malarial fevers, one of the greatest scourges of the tropics, it is essential that barracks be mosquito proof. To accomplish this permanent frames of netting must be placed in the windows and all other ventilators and the screen doors should be double like storm doors, so that one door closes automatically before the other is opened. The same protective netting should prevent the entrance of flies and mosquitoes to mess halls and kitchens. No camp or garrison in or out of the tropics, with flies in kitchen or mess halls should be considered in a sanitary condition.

As to permanent barracks I can best quote verbatim from "The Hygiene of the Soldier in the Tropics."⁹ Barracks should never be built hastily, as a simple shelter from the sun and a roof to keep off the rain; they should be, in every sense, a protecting, hygienic, and healthful lodging.

"*The colonial habitation should be built with the greatest care, and of material possessing sufficient resistance to withstand damage, as by the sun, rain, winds, meteors, humid or paludal soil, or the action of insects; if it suffers from these causes, the occupant would suffer more.*

"This is a principle too much ignored by builders who rely on the mildness of the climate and imagine that a simple screen interposed between the resident and the exterior suffices to protect him, without taking account of the danger from the proximity of a paludal soil.

"Constructed upon dry ground, or ground dried by fire and carefully rammed, the barracks should be raised upon arches, or even upon piles, whenever it is too difficult to obtain perfect drainage. Cisterns, reservoirs, pumps—anything in a word, which can hold moisture—should never be placed in barracks. Humidity, indeed, is the condition most favorable to the development of germs.

"The walls should be very thick. The ideal building in a tropical country would be of granite or of cemented marble, and the conquering Spaniards divined the best means of having cool houses in their lavish use of hard stone and marble in their sumptuous palaces in Havana.

"The walls should be painted, not white, but in light colors. It would be best to use oil paints, which vitrify the surfaces, facilitating cleaning and disinfection. The stairs should be iron, and wide passages should separate the apartments on each floor.

"The flooring of the ground floor should be well raised, a meter at least, especially if there are no cellars.

"The roofing should be double or doubled with a ceiling, and sufficiently inclined. In the colonies shingles, thatch, zinc, and brick are used. The most commendable roofing is

certainly one of fitted bricks resting on imbricated and strongly fastened shingles. Terraced roofs would have more inconveniences than advantages.

"A gallery is indispensable for each story. One sleeps inside the house, but one eats, receives, works—in fact, lives on the gallery. The flooring of the ground floor should be continued under the gallery, and the materials, glazed or ceramic tiles should be the same. It projects beyond the walls three to four meters and is supported by columns of brick, stone, or cast iron. The interior wall should be that of the house itself, painted gray or light yellow; the external walls should be made of fixed or movable Venetian blinds, or even of matting blinds. It is well to have the gallery run all the way around the house; one of the sides will then always be shady.

"All the windows should be *portes-fenêtres*, since all open upon the gallery. These large openings from floor to ceiling facilitate the renewal of the interior air. The outside shutters should have overlapping slats capable of being opened to admit the light; the interior doors should be glazed and ought to be closed at night. The rooms should be very large; the local accessories of the barracks should be on the ground floor."

These barracks should be mosquito proof. The water-closets should be of the latest automatic flush pattern and the floors and walls should be constructed of marble, stone or tiling and built with as much care as a modern surgical amphitheatre. Kitchen refuse should be kept in tightly covered metal receptacles, surrounded by a framework of netting, until finally disposed of. Flies should be absolutely excluded from this garbage. In temporary camps with no sewerage system sinks dug in the earth or the cylindrical, metal, trough, closet issued by the quartermasters' department must be used. If sinks are to be used the surface water must be at least five feet below the surface so that sinks four feet deep will at all times be dry. Proper sheds and shelter must protect the sinks from sun and rain. If sinks are used each man must

cover his dejecta as soon as passed, with dry earth. Some one must be responsible for the proper performance of this most important duty. One noncommissioned officer should be regularly detailed to each sink, the sink should be frequently inspected by company officers and once daily by a surgeon who should report to the commanding officer whenever any uncovered excreta are found. I cannot emphasize this point too strongly. Any other method of dealing with excreta in a sink renders that sink a menace to the health of the command. Disinfectants may be added to the sink and a covering of sand thrown in three or more times each day, but to render a sink a sanitary institution each man must thoroughly cover his dejecta as soon as passed. This is done in the German army, and has been done in our army as is instanced in many official reports. As far as my experience goes, it would seem that what is needed to make this practice effective is the hearty co-operation of the company officers with the medical officers. It has been my misfortune to see this method fail when division and regimental orders left nothing to be desired, and on account of the perfunctory enforcement of the order by company officers. If the company officers do not fully appreciate the necessity of keeping excrement out of the food, it will not be kept out.

Flies carry particles of dejecta and disease germs from dejecta to the food and also directly to the hands and mouths of men.

If sinks are impracticable on account of the high level of surface water some system of dry earth closet must be used, and the system, whatever it is, is valueless and fraught with danger if at any time flies come in contact with dejecta. Cavalry and light artillery officers have another problem: the disposal of horse manure which attracts flies in large numbers, but which, fortunately, is not in itself, such a menace to health as human excrement, owing to the comparatively few diseases transmissible from horse to man. Where it is practicable crematories should be established for consumption of organic wastes and in them, the germs of disease.

This matter of proper disposal of wastes is no trivial one and requires much perseverance, tact, and judgment, on the part of all concerned.

(G) *Work, Recreation, Habits, Etc.*

Can as much work be done in the tropics as in the temperate zones?

The amount of work capable of being performed by the human machine has been determined with precision, and may be divided into internal work, or work required for the performance of the bodily functions, and external work. This internal work varies greatly and has been estimated at about 260 foot tons. An average day's work (external work) is about 300 foot tons. Referring to a table of Haughton's in Notter and Firth's Hygiene¹⁰ (page 421), it is seen that an Indian dhooli bearer does 600 foot tons of work daily and an Indian hill coolie 500 foot tons. From these figures it would appear that the external work of tropical laborers is not less than that of laborers of temperate climates. Troops composed of natives of the tropics, then, might be expected to perform as much work in the tropics as troops in the temperate zones.

In practice it will be found that the average of work performed by our troops in the tropics is decidedly less than the average of work performed at home, and that this is of necessity the case. Although for a time the American soldier in the tropics is able to perform his usual amount of work, interference with internal work by extreme heat, or its effects, or actual disease caused by germs, will sooner or later decrease his capability for external work. It would seem useless to dwell longer on a matter of common knowledge and observation, but other phases of the question may be dwelt on with advantage. The character of the work should be confined to strictly military duties and native laborers should be freely utilized as scavengers, for policing, for handling supplies, and, in campaign, for digging trenches, throwing up earthworks, for carrying blanket rolls, knapsacks, and even extra ammunition where wheel transportation is impracticable. It has

been demonstrated that, with proper handling, natives make excellent litter bearers, and can relieve the hospital corps of menial duties in field hospitals, thus allowing these sanitary soldiers to minister more effectually to the needs of the sick and wounded.

In garrison, drills and ceremonies should be conducted in the early morning, and should be interspersed with frequent rests and changes.

The laws of Fatigue and Refreshment, always of importance in exercise and physical training, are most carefully to be regarded in the work of the tropical soldier. The law of fatigue may be stated as follows: "When the same muscle (or group of muscles) is kept in constant action until fatigue sets in, the total work done, multiplied by the rate of work, is constant.

"The law of refreshment depends on the rate at which arterial blood is supplied to the muscles, and the coefficient of refreshment is the work restored to the muscles in foot pounds per ounce of muscle per second. For voluntary muscle it is .1309 and for the heart .2376, or exactly equal to the work of the heart, which never tires."

In campaign, although the hours of work can not always be selected, still much may be done towards conserving the health of the men by the use of native bearers and coolies.

While overfatigue should carefully be avoided a proper amount of exercise is essential for the avoidance of ennui and the preservation of health. One hundred fifty-foot tons is considered the minimum amount for this purpose and is equal to a walk of about nine miles. In this amount the exercise taken walking around in quarters, etc., must be considered and if marches are taken with arms and accoutrements the weights carried must be considered. The nature of the ground whether level and hard or otherwise must also be considered.

The time of the men should be fully occupied. Up to date schools should be conducted and libraries and games for amusement furnished. The customary siesta should be observed in so far at least as to allow the soldier to rest two or

more hours in the middle of the day in any way he sees fit. The schools should be made of interest in every way possible. Besides instruction in the primary branches lectures on the university extension plan might well be given. The history and geography of the country could be studied to advantage. Sanitary matters having special application to the conditions under which the troops are living could be discussed with advantage to all concerned. A voluntary library could readily be raised and the civil aid societies would gladly contribute to such a purpose if the matter were properly brought before them.

To have an efficient tropical army temperate habits are a necessity. From a consideration of the many opinions and theories concerning the necessity of taking some form of alcohol in the tropics, opinions and theories advanced by those in no way competent to form an opinion or advance a theory on this or any other medical subject, as well as by those competent to speak on the subject, from my knowledge of life in the tropics and of the effect of alcohol on the human economy, I have no hesitancy in stating as my opinion that alcohol is no more necessary in the tropics than it is here. Further I believe it is conceded that over indulgence in alcohol is peculiarly dangerous in the tropics, as this or any other practice that lowers the vitality of the body renders it an easy prey to disease. In speaking of yellow fever Wolfred Nelson in the Twentieth Century Practice says: ¹² "The moderate drinker, as a rule, is lost from the start. * * * The use of alcohol in any form by newcomers within the tropics is a very pernicious habit. * * * If one must live in the tropics, or try to live there, let total abstinence be made a rule of life."

If alcohol is used at all in the tropics, strict temperance must be observed in its use.

The hours of sleep must not be abridged, as the resisting power of the organism is thereby reduced.

In localities where venereal disease abounds, periodical medical inspection of the men is advisable.

Finally, cases of sickness should receive prompt attention and a periodical inspection of the feet, such as is required in the German army, should be made.

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THE PHYSICAL DEVELOPMENT OF THE RECRUIT.

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THE physical development of the recruit is of interest to all army officers because all desire to have in their commands men of fine appearance and muscular power. But to us as military surgeons it is especially so because we recognize its importance as a factor in preventing disease. Nevertheless no attempt has been made in our Army to utilize in practice this branch of military hygiene.

It is strange that in the United States where so much has been done to increase the efficiency of the Army by the enforcement of prophylactic measures against disease, so little attention has been paid to the physical development of the soldier as a measure to increase the resisting powers of the system against the exposures incidental to military life.

In this respect we must admit being years behind almost every European power. Austria and Germany recognized the value of physically trained soldiers as far back as 1842. Russia after her experience in the Crimean war lost no time in establishing schools for the training of her soldiers as did France after her disastrous encounters with the military athletes of Germany. England, Norway and Sweden all have compulsory physical training in their armies and no one can gainsay the splendid results accruing therefrom.

It is to be regretted that a compulsory system of physical exercise is not in use in the United States Army. Heretofore we have not felt the need of it; our Army has been small and the varied duties of the men kept them employed giving them plenty of exercise but not exercise of a character calculated to do the most good. The hardships and exposures of actual

campaigning in which there was required just that reserve power which is given by properly conducted physical drill were not known, and it is only now when the majority of our troops are actively engaged in such work that we realize the value which a thorough course of military physical drill would have been to them.

The physical drill for our recruits and soldiers as practiced in the Army at the present time is wrong because unsystematic. Physical exercise of all kinds is encouraged but no drill is ordered. The provision for drill is left to the commanding officer of the garrison who may or may not order exercise of this kind as he sees fit.

For this reason probably little benefit has been derived from what has been done. In many instances drill call is sounded too soon after breakfast and were it not for the perfunctory manner in which the work of the drill hour is carried out it would result in harm rather than benefit.

Generally the exercise to which the recruit is subjected in his drill in the "Manual of Arms" is regarded as all that is necessary for his military development. But drill with the rifle while it gives exercise develops the muscles of only one side of the body and does so at the expense of the other side if continued any length of time. Besides this drill after a while becomes more or less automatic exercising the muscles without interesting the brain.

The exercises usually adopted to supplement the deficiencies of military drill are taken from "Butt's Calisthenics" and are in themselves excellent and all that could be desired for the development of the recruit; but they are selected in a haphazard manner by the drill master usually a non-commissioned officer who has no idea of the results to be obtained from their use.

New recruits are made to fall in and use the same exercises as those who are more advanced. Exercises of a severe character that should be used only after the muscular system of the recruit has become used to them being given for the same length of time and alternately with those of the simp-

lest character. Unnecessary and harmful exercises are given to recruits: such are those tending to increase the muscular development of parts already abnormally developed from their previous occupations. The dangers of too long or too severe exercising is not appreciated by the uninstructed drill master nor is he qualified to alternate the exercises so as to obtain the desired results. In fact the extent of the knowledge of drilling recruits possessed by most non-commissioned officers is limited to the giving of commands as prescribed in some drill manual.

It can readily be seen that under such conditions the chance of obtaining good or bad results are about equal.

Our knowledge of hygiene points out to us that this system is radically wrong. Physical drill if properly supervised will bring the system of the recruit into that condition upon which depends military efficiency. This physical training is of double value as it not only gives to the soldier the strength of constitution which enables him to sustain the hardships of campaigning without which he will eventually break down, but it also gives to the service men physically trained both in mind and body, bright, active and with physical strength and endurance, qualities necessary to an efficient military command.

In the physical examination of the recruit many defects in his physique may be detected; these may not be so serious as to disqualify him for military service but it must be remembered that as a chain is no stronger than its weakest link so the recruit is no stronger than his weakest part be it his heart, lungs or legs. Hence, the physical drill or exercise in the case of each recruit should be directed first to strengthening his weakest part and incidentally in doing this the whole system is benefitted.

Military athleticism should have in mind three factors: activity, strength and endurance, these three qualities being essential to the soldier. With a sound constitution as a basis these may all be obtained by physical exercise properly conducted. But, as before stated, each recruit has some partic-

ular defect to be remedied and all may not be benefitted by the same character of exercise. Judgment must therefore be shown in the selection of exercises and this can only be done by having, not only a knowledge of the exercises, but, also of the muscles engaged in performing the movements. Also, the instructor should have some knowledge of the physiology of the heart, lungs and circulation that he may not over tax the strength of a recruit not so well able to sustain the strain as others. The exercises should be graded so as to be always well within the powers of the weakest in the class.

Before we can look for improvement in the general development of the recruit in our Army two things should be done. First, physical exercise should be made compulsory and a certain amount of time set aside each day for that exercise. The possibility of having it done should be taken out of the hands of Post Commanders who should by orders from superior authority be required to see it carried into effect. Second, the instructors should be men who have themselves been instructed specially in this branch of military science.

In order that this may be accomplished a certain number of non-commissioned officers from each regiment should be sent each year to one of our large posts (preferably one used as a recruiting depot, where during the latter part of their course they could have materials with which to work) and under the supervision of a medical officer be instructed in this branch of military training.

This course should be extended over from four to six months during which time the men should be given an elementary course in Anatomy, making them familiar with the actions of the heart, lungs and all the muscles in so far as these are related to exercise. In physiology they should be shown in a popular or non-technical way how exercise conduces to metabolic changes in the tissues, together with the effects of faulty training, over training and lack of training.

They should be instructed how to take measurements and how to record the gain made during his course of instruction by any recruit. Then having a good idea of the muscles and

their actions they should be taught exercises tending to counteract the minor defects found in recruits. Those tending to give agility and suppleness being first taught and subsequently those which are of a strength giving character. They should be impressed with the dangers consequent upon improper drill and should be taught to instruct the recruit, making their exercises as much a recreation as a military duty, for in this way only will the best results be obtained.

When, through this schooling we are able to get a good corps of drill masters, who are not only capable but earnest in the performance of their duty, we may then anticipate good results from our system of physical training.



EFFECTS OF OVERWORK, ESPECIALLY AS APPLIED TO TROOPS.*

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IT HAS been stated, by one of the successful generals in the late war with Spain, that "The proper time of rest and the safe amount of marching are as much a part of the soldier's duty and training as is personal courage, discipline and tactical skill on the field of battle."

There are four duties which are of much importance in a soldier's life, from which the effects of overwork will plainly show itself: (1) marching to a desired destination; (2) on the firing line in battle; (3) on guard duty; (4) drilling on the field.

1. *Marching to a Desired Destination.*—It often becomes necessary, sometimes absolutely so, for troops to make long and rapid marches to reach the field of battle in season to be of use; but if such troops are brought on the battle line exhausted and overtired, and, as a consequence, less courageous than under different circumstances, they would necessarily be more detrimental than a benefit to the cause they were to fight for. Although the troops had marched a great distance and made remarkable time in order to reach the point desired, they would be compelled to take an obscure and unimportant position, such as the rear line, or perhaps far away in the reserve, while well equipped in all other respects, on account of being overworked, and, in consequence of this, lacking strength and physical force necessary to battle courageously and successfully. It is a conceded point among all military men who have had experience on the battlefield, that men, to be cour-

*Read before the School for Medical Officers of the Massachusetts Volunteer Militia.

ageous, persistent and successful in battle, must reach the field in as fresh and healthful condition as possible, mentally and physically.

It is a difficult problem to solve, and no set of rules can be formed for a guidance,—that the troops can march just such a distance, and just so fast each day, and not be over-worked. Among military men, opinions differ very much. One of the successful brigade surgeons of the late war, and of much experience in the civil war, has said that any body of troops should be able to walk twenty miles or ride forty miles each day, and keep it up for some time. Another officer of much experience has said that his command had often marched twelve miles a day and quite a number of times marched thirty-two miles in a day. On making inquiry more particularly into the matter of the thirty-two miles per day, he said if a halt was made most of the men would drop to the ground at once, and be sound asleep in less than a minute, and when the time came for them to move, it would be almost impossible to arouse them; and generally after such a long march it would be at least a week, if not longer, before the men would recover from such a strain. Another officer, quite as experienced, has said that troops should not march much if any over five miles per day previous to battle, as that is all that is possible to do and not be overworked.

Therefore, one of the effects of marching to the point of overwork is that troops are less able to go into battle and fight as soldiers are expected to fight; and, unless having all the energy and vitality they possess at hand, battles may be lost which only for this detriment should be gained.

2. *On the Firing Line in Battle.*—One of the effects of overwork of men on this duty is loss of nervous vitality and nervous energy to a point of either temporary insanity or collapse; and one of the greatest causes of this deplorable state at this critical time is the lack of protection of some kind during the battle. If, however, they are protected, even if but slightly, by a clump of trees, trenches, or rifle pits, it is possible for the men to stay on the firing line a long time and

not become overworked or exhausted. More especially is this marked where refreshments of some kind, even of the simplest in quality are furnished.

3. *On Guard Duty.*—It may seem a strange thing to believe that men can be overworked and exhausted while on guard duty; but it is nevertheless a fact, corroborated by officers and men in both the civil war of 1861 and the last war of Cuba and the Philippines. If a man is on outpost or picket duty in a strange country, where the enemy are active and treacherous, it is very necessary to relieve the guards often, or they become very much overworked and exhausted. It is not altogether the loss of sleep at night, but it is the overstraining of the nerves, in keeping up the constant watch and expectancy, that wears upon the vitality of the guard. After performing such duty, it is necessary that the guard be relieved from duty of any kind from eight to ten hours at least, in order to recuperate, or he is soon relegated to the hospital, unfit for any duty. Only as late as April, 1900, General Young in northern Luzon made several requests that he be reinforced, as the men were becoming exhausted by the necessity of constant vigilance.

4. *Drilling on the Field.*—This is a question on which many different opinions might be gathered as to the proper amount of drilling troops should have each day, and not become overworked. It is quite possible to drill men that have but recently enlisted in the army, and that are not habituated to the mode of living in the field or camp, to a point of exhaustion; but if men are used to the work, and have performed it for some time, it is hardly probable that they can be overworked. The object in view is to get the men to work industriously and diligently as many hours in the day as possible without becoming overworked. In order that the troops may be able to do a sufficient amount of drilling, it is necessary that each man be thoroughly interested in the work. An officer who keeps the men interested all the time is successful, and is able to keep his men hard at work and for quite long periods without any detrimental consequences; every order

is obeyed promptly, sharply and exactly as given, and the entire command is proud and pleased to learn something; and time passes so rapidly that before the men realize it they have done a long and hard day's work, and not become overworked in the least degree. On the other hand, an officer who is unable to make his men feel interested in their work is sure to come into camp from drill with his men tired, exhausted and discouraged; and during the time of drill every command that is given seems to be obeyed with an exertion and reluctance, and the men seem to be hardly conscious of what they are doing; time drags heavily, and they wish it would soon end, that they might be relieved. After such work as described, the command is not fit for anything but absolute rest.

I might quote many officers whose assertions would coincide with mine in every particular, and who state that it is easy to account for the failure of troops sometimes where they should succeed; viz., that by the lack of constant care and forethought the troops are many times overworked, and therefore fail to do the expected.

WHAT IS THE NATURE OF THE PORTO RICAN "ANAEMIA?"

By HERBERT M. McCONATHY, M. D.

CONTRACT SURGEON IN THE UNITED STATES ARMY.

DURING the years of 1899 and 1900 the attention of the U. S. Army surgeons who were then serving in Porto Rico was called to a disease which is quite common among the inhabitants of that island, and which is known there simply as "anaemia." This disease is interesting first, on account of its high mortality,—there are practically no recoveries; and secondly, on account of its prevalence. On this latter point no statistics are obtainable, the Spanish official figures being, in my opinion, absolutely worthless. However, I asked several resident Spanish physicians for an estimate as to its prevalence, and was astonished to find that at least fifty per cent of the total number of deaths are attributed to this disease alone.

Opinions as to the cause of this trouble are various. Insufficient nourishment is, naturally, the usual reason assigned, because the poorer people live on plantains almost exclusively. There are some who think rheumatism an important factor on account of the pains in the limbs during the earlier stages and the frequent involvement of the heart which follows. The only real study of the disease of which I have heard was that made by Lieut. Bailey K. Ashford, Assistant Surgeon, U. S. Army who was at that time in charge of the hospital at Ponce. Dr. Ashford pronounced the disease ankylostomiasis.

From about the first of September, 1899 to about the first of August 1900 I was stationed in Adjuntas, a small town in the interior where this disease is especially common, and during these eleven months I saw hundreds of cases. As my post

was small I could not secure a microscope, but I made many autopsies.

In all of these cases I found a few very constant symptoms. During the first stages most patients complained of pains in the limbs, sometimes quite severe, but hard to locate definitely. Tenderness on deep pressure of the limbs was generally elicited during the examination although partial anaesthesia of the skin was frequently noted. In many cases the gait appeared more or less ataxic. Dilatation of the heart was always found, and during the later stages this was usually accompanied by a general anasarca; a swelling of the feet being one of the earliest symptoms. This dilatation of the heart is not, as a rule, accompanied by any valvular disease or other signs of endocarditis, though a relative valvular insufficiency, owing to the dilated rings is very early and constantly noted, and gives, of course, a strong systolic murmur.

It will be seen from the above that my study of the disease was very incomplete, I had no idea at the time that I was meeting anything particularly new or strange; moreover, none of the soldiers were affected. But even from this incomplete study there were shown to be some objections to all the theories as to the cause of this malady. Insufficient and improper food is, without doubt, the main predisposing cause; in fact it is hard to understand how a human being can sustain life on the diet on which a majority of the Porto Ricans subsist, especially those who live in the mountain. But starvation can not be the only cause of this so-called "anaemia" for cases are occasionally met with in persons who are well-fed. The rheumatism theory can be dropped on account of the absence of definite joint symptoms and of endo- or pericarditis. As to ankylostomiasis, I can readily credit the statement that it is wide-spread in Porto Rico and productive of much harm, but this diagnosis will not account for the partial anaesthesia, the rheumatic pains and the tenderness of the muscles on deep pressure. The dilatation of the heart I found to be such an early and constant symptom that it is hard for me to believe it merely a result of the anaemia.

Since coming to the Philippines I have seen a disease which reminds me very forcibly of the Porto Rican one; it is beri-beri. The more I see of beri-beri the more striking the resemblance seems. I regret that I did not test the knee-jerk in the Porto Rican "anaemia" for the absence of this reflex is an important point in the diagnosis of beri-beri, and this is the only thing lacking to establish in my opinion, the identity of the two diseases. It would not surprise me if it were found upon investigation that beri-beri and ankylostomiasis were combined in many of these cases of Porto Rican "anaemia." At any rate, I am firmly convinced that in a large proportion of these cases we have to deal with a specific disease and not with merely the results of starvation.

Apart from the scientific interest of this question, it is one of vital importance to the island, for if this anaemia prove to be a specific disease the physicians as well as the laity of the island should be instructed as to its prevention and cure, for under the present system of treatment the mortality as mentioned above, is practically one hundred per cent.

Moreover, this disease is generally chronic in its course, and its victims exist in a state of invalidism or semi-invalidism for months before they finally succumb. This fact, combined with the exceeding prevalence of the malady greatly impairs the working power of the population and interferes most seriously with the progress of the island.

I would be very glad to hear an expression of opinion on this subject by those surgeons who have served in Porto Rico and who have also come in contact with undoubted cases of beri-beri.

DUTIES OF THE MEDICAL DEPARTMENT AT “GENERAL QUARTERS.”

BY DUDLEY NEWCOMB CARPENTER, M. D.,

PASSED ASSISTANT SURGEON IN THE UNITED STATES NAVY.

THE ALARM has sounded and the ship is being “cleared for action.” The Surgeon’s division, consisting of the Assistant Surgeon, Hospital Steward and Hospital Apprentices, aided by as many convalescent patients as may be available, will equip the selected “Dressing Station,” which on this battleship is the warrant-officer’s mess-room, on the berth deck, within the casemate. The mess table will be unfastened and placed in one corner of the room, and on it will be arranged the various dressings, stimulants, sterilizer, etc. The Siegfried portable operating-table is removed from its case and occupies the space where the mess table was. A large “cargo-light” is swung above this table for extra light. Irrigating solutions of bichloride and boracic acid fill the large bottles in the portable-rack attached to the forward bulkhead. Instrument-pans and basins with antiseptic solutions are placed on the transom.

The following equipment of this dressing-station will be provided :

- | | |
|---|---|
| 1. <i>Anaesthetics,</i>
Chloroform,
Ether,
Cocaine,
Morphine,
Rhigolene. | Green soap,
Alcohol,
Ether,
Bichloride sol. 1-2000,
Sterile distilled water. |
| 2. <i>Aseptic preparatives.</i>
Razor,
Nail brushes,
Basins | 3. <i>Table,</i>
Rubber sheet and pillow-case,
Blankets,
Tub beneath to receive solutions, |

4. *Haemostatic and Operative,*
 Case of Haemostats,
 General Operating case,
 Instantaneous tourniquets,
 Esmarch's Bandage,
 Needles, (assorted),
 Ligatures, (catgut and silk),
 Sutures,
 Sterilized gauze abdominal pads,
 " " sponges and strips,
 " " towels and sheets.
5. *Dressings,*
 Sterile Gauze, { Bichloride, . . .
 Iodoform,
 Cotton (Borated),
6. *Restoratives.*
 Bandages, { Muslin, Gauze,
 and Plaster,
 Slings,
 Pins and Safety Pins.
 Collodion,
 Splints (wire and wood).

The "Ames Boards*" are placed on the decks and "first aid" packages are distributed by the hospital apprentices to the officers and crew of each division. Instruction in first aid and the use of the board is part of the regular drill in times of peace. At the foot of the ladders, on the deck where the dressing-station is situated, are "aids-to-the-injured" taken from the convalescent patients or "idle" especially detailed for this duty. These aids are directed to receive wounded as they come below on the boards and to carry them to the place the Hospital Steward designates. They then return the boards to the deck from which they came. The Hospital Steward decides which cases need immediate attention and sends them to the operating room. The cases which can wait he makes comfortable by mattresses and blankets, hypodermic injections of morphia, or stimulants when necessary. Any cases that have not had their first-aid dressing applied he attends to, and inspects those who have had to see that the dressings have not slipped. On this battleship† the entire berth deck within the casemate, including chief petty officers' mess room, engineers' log-room, passage-ways, and officers' staterooms, would be utilized as a hospital and could

*These were inadvertently styled "Mahan Boards" in the author's paper on page 432 of the present volume. They were designed and first employed by Surgeon H. E. Ames, U.S.N. in 1893.

†The U. S. S. "Illinois."

readily accommodate 150 wounded. Both surgeons and hospital apprentices will be in the dressing-station.

When battleships are constructed with a sick-bay outside the casemate it would be advisable to fit a convenient room within so that it could be used in action as an operating-room. With very little trouble a similar room to this one could be fitted with rack for irrigators and with folding wall-tables to hold dressings and instruments without interfering with its value as a mess-room. To be readily cleansed the floor might be of small marble-tile in cement (Mischiati). A large door would facilitate the handling of the patient.

During action there is generally an "engaged" and "disengaged" side of the ship. When a man is wounded on the engaged side then, men from the disengaged side will be available to render aid and send him below. This brings up the question if the wounded should be moved at all during action. Sufficient experience with modern ships has not accumulated to answer this question definitely, and many reasons can be given for and against such removal. On a Japanese cruiser, during the Chinese-Japanese war, and again on the flagship "Reina Christina," during the battle of Manila Bay, the wounded, collected at such a dressing-station, were destroyed by the penetration and the explosion of a shell. On a battleship they would be better protected below. Besides, their presence near the guns might tend to shake the nerves of the crew, and also expose a wounded man to additional injury. Therefore it seems more advisable to send them to the dressing-station in the first place. On a protected or unprotected cruiser the same reasons hold good, for the dressing-station is certainly as safe as any other part of the ship, and the surgeon would have every means at hand there to properly treat the wounded. One objection, the rapidity of removal from the deck, is answered by the Ames Board, and its simplicity and inexpensiveness should permit as many as are necessary, to be had.

If there should not be time to apply the first aid dressing on deck the wounded man can be fastened to a board and sent

below. Arterial hemorrhage must be stopped, however, by means of the sailor's kerchief used as a tourniquet. Should a man not be rendered helpless by his wound he may be able to walk to the dressing-station. Wounded men in the fighting-tops should be sent below on the board by means of the ammunition whips. On the super-structure and bridge-decks the boards from the upper decks may be used. Injured men or those overcome by the heat of the fire room, can be sent up on the boards through air-locks, or by any direct hoist. In the turrets of battleships the wounded may be easily removed from the lower platform.

The operative measures adopted during action will be entirely for the relief of arterial and venous hemorrhage, by ligation or by packing. Every wound will carefully be rendered aseptic, the ragged edges trimmed and sterile dressings applied. Extended operations on individual cases will probably not be attempted until after the engagement is over.

THE SURGEON GENERAL OF THE GERMAN ARMY.

SURGEON GENERAL Rudolf Ferdinand von Leuthold, First Physician-in-Ordinary to the German Emperor, has been appointed Surgeon General of the German Army in succession to the late Surgeon General von Coler. Surgeon General von Leuthold was a student at the Frederich Wilhelm Institute, and received his professional education at the University of Berlin. After passing the State examination in 1857, he became an Assistant Surgeon in the Army, was promoted to the grade of Staff Surgeon Major of the second class in 1867, Staff Surgeon Major of the first class in 1875, and Surgeon General in 1889. He was associated with the late Professor von Lauer in the medical care of the Emperor William I., and on the accession of the present Emperor was chosen by him to be his Physician-in-Ordinary. Surgeon General von Leuthold was for many years professor of military surgery in the Kaiser Wilhelm Academie, and up to his promotion was also one of the editors of the *Deutsche militärärztliche Zeitschrift*, the German medico-military journal.

THE ADAPTATION OF ACETYLENE ILLUMINATION TO MOBILE FIELD HOSPITALS.

By CAPTAIN EDWARD L. MUNSON, A.M., M.D.

ASSISTANT SURGEON IN THE UNITED STATES ARMY; SURGEON
GENERAL'S OFFICE.

SOME three years ago the writer became interested in the possibilities of acetylene illumination for barracks and post hospitals, and conducted a number of tests in connection with an acetylene plant installed for trial at the Company of Instruction, Hospital Corps, U. S. Army General Hospital, Washington Barracks, D. C. The results obtained were so favorable to the use of acetylene gas as a desirable means of illumination when electricity or city gas could not be obtained, that the investigation was continued with a view of determining the practicability of acetylene for the illumination of tent or other temporary hospitals, having particular reference to the facilitating of field surgery. Throughout this work the writer received the utmost assistance from the J. B. Colt Company, makers of acetylene generators, 21 Barclay street, New York, who spared neither expense nor trouble in the effort to perfect an illuminating outfit which would best meet all the conditions of field hospital service.

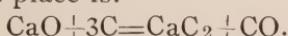
The ideal outfit for field hospitals should be portable, light, compact, simple in construction, not liable to get out of order, easy to put up and take down and to pack and unpack. It should be automatic in operation, and the latter should be such as to be easily understood and regulated by the dullest soldier. It should give a light of any desired intensity in any part of the hospital, and should maintain this illumination for a reasonable period without the necessity of recharging. The generating apparatus should be economical in its use of carbide, and be free from any liability to accident and explosion. Clearly,

it was not a simple matter to combine these various essentials in a single outfit.

Several experimental outfits were made which proved more or less defective; and later improved outfits were sent to the U. S. Army Field Hospital at the Pan-American Exposition, the tents of which were illuminated by them during nearly all the exposition period. As a result of this extended practical trial, certain minor defects which were still found were corrected,—and the field hospital outfits described in this paper undoubtedly represent much the most complete and practicable equipment for medico-military use yet devised. Of this fact, the Board of Revision of the Supply Table, lately in session, was apparently satisfied, as the new outfits have been promptly adopted as part of the U. S. Army field hospital equipment. They had also been previously adopted by the Canadian military service, and several outfits have been sent to South Africa with the field hospitals accompanying the Canadian contingent.

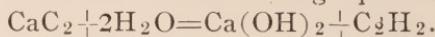
Inasmuch as acetylene lighting has been brought into practical use only within a few years, and as many are hence not familiar with the physical and chemical properties of this gas, its method of production and illuminating powers, a brief preliminary consideration of these points may be of advantage before entering upon a description of the field illuminating outfits.

Acetylene gas is made from calcium carbide, which is produced by fusing together ground quick-lime and coke in the electric furnace, at a temperature of 4500 degrees F. The change which takes place is:



Calcium carbide is a hard, dry, solid, opaque, crystalline substance, of a dark brown or black color. Its chemical formula is CaC_2 . It is incombustible in the atmosphere, will bear heating to redness without change, bears transportation admirably and may be preserved indefinitely if protected from air. Like lime, it is affected by the moisture present in the atmosphere; and combines with it to form slaked lime, acety-

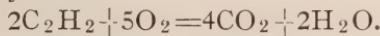
lene being given off during this combination. The addition of water causes this change to occur very much more rapidly, and in accordance with the following equation:



It is thus seen that beside the acetylene gas, C_2H_2 , a by-product is milk of lime, $\text{Ca}(\text{OH})_2$, which is of maximum causticity and is excellent for purposes of disinfection. As the milk of lime is made direct from calcium carbide, there is no opportunity for loss of causticity as a result of exposure to the carbon dioxide of the air, as occurs with ordinary quick-lime after burning, and the resultant is always an efficient germicide. Even the secondary products in the acetylene illumination of field hospitals thus have an immediate and positive value. Both generators use the same size of calcium carbide, No. 14, which is also the size used in the new acetylene illuminating apparatus adopted recently by the Signal Corps for night signalling. This is a point of advantage in connection with emergency supply.

Chemically, sixty-four parts by weight of carbide require thirty-six parts of water, producing seventy-four parts of slaked lime and twenty-six parts by weight of acetylene gas. In practice, however, generators of the best type require water in the proportion of one gallon of water to one pound of carbide. This is necessary to prevent the heating up of the apparatus during the generation of the gas and also to ensure the rapid and even production of the latter; for like quick-lime, calcium carbide becomes very hot when acted upon by water. The generation of acetylene under conditions of high temperature is undesirable, as this gas is partially converted into other polymeric substances, like benzol, C_6H_6 , and styrolene, C_8H_8 , which not only by so much reduce it in quantity but also injure its quality by their presence. These and similar by-products cause the gas to burn with a persistent smoky flame and in part deposit a solid tarry residue at the point where the heating takes place. Converting measures of weight into bulk, one pound of commercial calcium carbide may be expected to yield five cubic feet of acetylene gas at ordinary pressure and temperature.

Acetylene is a colorless gas, possessed of a penetrating odor similar to that of garlic; but this odor is not perceptible during combustion, and should it be detected about an apparatus in operation it may be regarded as due to a faulty joint, open cock, or leaky pipe. Acetylene burns free in the air with a brilliant but smoky flame. When its illuminating power is properly brought out with a suitable burner, it yields a light of greater brilliancy than is furnished by any other gas. All hydrocarbons burn in air with production of carbon dioxide and watery vapor, but the quantity of combustion products compared with the volume of gas burned varies with the character of the hydrocarbon used. The combustion equation of acetylene is:



Or one cubic foot of gas burned deprives the surrounding air of two and one-half cubic feet of oxygen and throws into it two cubic feet of carbon dioxide and one of watery vapor. For the same amount of light produced, acetylene deprives the air of oxygen and produces carbon dioxide to the extent of only about one-fourth as much as coal gas. This is highly important in considering the vitiation of air in an enclosed space, as a barrack room, though of course is of no importance in connection with the illumination of tent hospitals. As with all inflammable gases, acetylene is capable of exploding if mixed with air before ignition, a mixture containing about 7½% exploding with the greatest violence. With present types of generators, however, there is no more danger of an explosion with acetylene than with coal gas. The ignition point of acetylene is about 900 degrees F., where that of coal gas is 1100 degrees F.; the temperature of an acetylene flame is 1800 degrees F., where that of coal gas is 2450 to 2500 degrees F. Acetylene has high illuminating powers, while coal gas contains gases which burn with the generation of a high amount of heat but which give off little if any light. The lower temperature of the acetylene flame is an important point where the overheating of tents or buildings in hot weather is a matter for consideration; and is very favorable to

the use of acetylene under such circumstances. Cubic foot for cubic foot, acetylene has about thirteen times the illuminating power of coal gas.

It is necessary to use a special burner with acetylene in order to supply sufficient air to result in complete and smokeless combustion; and also to prevent the burner from becoming too hot and causing the gas to polymerize in the way already mentioned, with the deposition of solid matter and the clogging of the passages with soot. Controlled by a suitable burner, the flame of acetylene is absolutely white and of intense brilliancy. In quality, it is the nearest approach to day-light known. Its spectrum closely resembles that of sunlight, and consequently all colors appear the same as by daylight, instead of being distorted as by the light from gas, candles, oil or electricity. This quality, together with the clear definition of objects brought under its influence, makes illumination by acetylene of particular value for surgical work, and especially for operations implicating the abdominal cavity. The possibility of concentrating a large amount of light is also a matter of the utmost advantage in field surgery, as any desired amount of light can be thrown on the field of operation from one or more clusters of burners. A single cluster of four burners, with reflector, can be made to furnish a light equal to 200 candles or 20 lanterns, and gives a brilliant light sufficient for the accomplishment of the most delicate surgical work. Obviously this means a tremendous advance in the possibilities of field surgery over the old days when a large artery like the femoral was tied by the light of a single candle, necessarily held so close that the hot grease scalded the hands of the operator and flesh of the patient, or where a delicate bit of brain surgery had to be done by the scanty light which could make its way through the dirty glass of one or two lanterns. How great the intensity of light yielded by the field acetylene illuminating outfit really is can be readily appreciated from the accompanying night photographs of the U. S. Army Field Hospital at the Pan-American Exposition, taken by the acetylene light itself. In the photograph of the

office tent, shown elsewhere, lighted by two $\frac{3}{4}$ foot burners of 37-candle power each, even the titles of the books on the field desk could be read without difficulty. In all these night photographs, the clearness with which the objects photographed are defined and the sharpness of the shadows cast are very apparent. Certainly it means much to the operating surgeon to have an abundance of light of this excellent character immediately available under all conditions of field service where

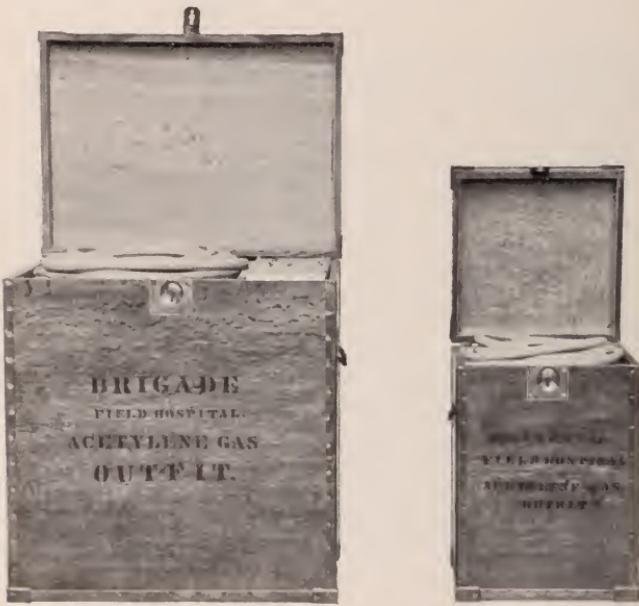


Chests containing full brigade and regimental acetylene illuminating outfits.
A two-foot rule appears in the photograph to show the size of these chests.

lanterns can be carried, and the recent equipment of the Medical Department with apparatus for producing such a light will contribute largely to the comfort and welfare of patients and to the ease of administration of field hospitals.

The cost of acetylene illumination is necessarily made up of two elements—the first cost of the generator and its appurtenances and the current expense for calcium carbide. The first factor of original outlay is small, the regimental field hospital illuminating outfit costing in the neighborhood of

\$35.00 complete. The generator of this outfit alone retails at \$15.00. If made up in quantity, the parts could of course be sold more cheaply than at present. As to calcium carbide, the present cost of this material is in the neighborhood of \$2.50 per hundred-weight in any part of the United States. Since a pound of carbide yields, as a fair estimate, five cubic feet of gas, the cost of illumination, outside of first cost for apparatus, is 0.5 cent per cubic foot. The ordinary acetylene burner consumes one-half a cubic foot of gas hourly, giving a

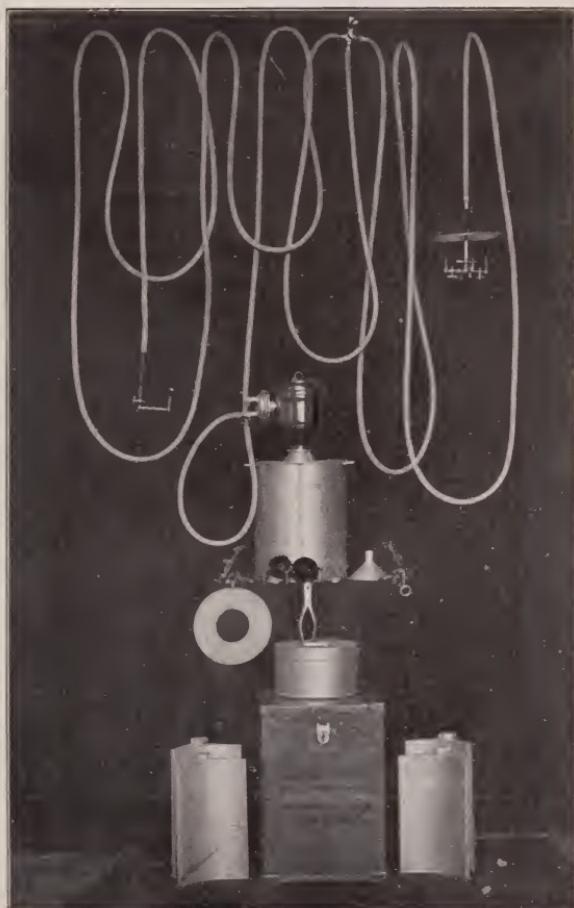


Chests containing full brigade and regimental acetylene illuminating outfits, packed for transportation.

light equal to 25 standard candles, and at a cost of 0.25 cent per hour. Taking coal-gas to cost the unusually low amount of one dollar per thousand cubic feet, and the ordinary flat gas burner to use six cubic feet hourly in furnishing a light of but 20 candle power, it is seen that coal gas costs 0.75 cent per hour per 25 candle-power light, or three times as much as acetylene. With respect to mineral oil, with which acetylene should be compared in the field, it is obvious that the first cost

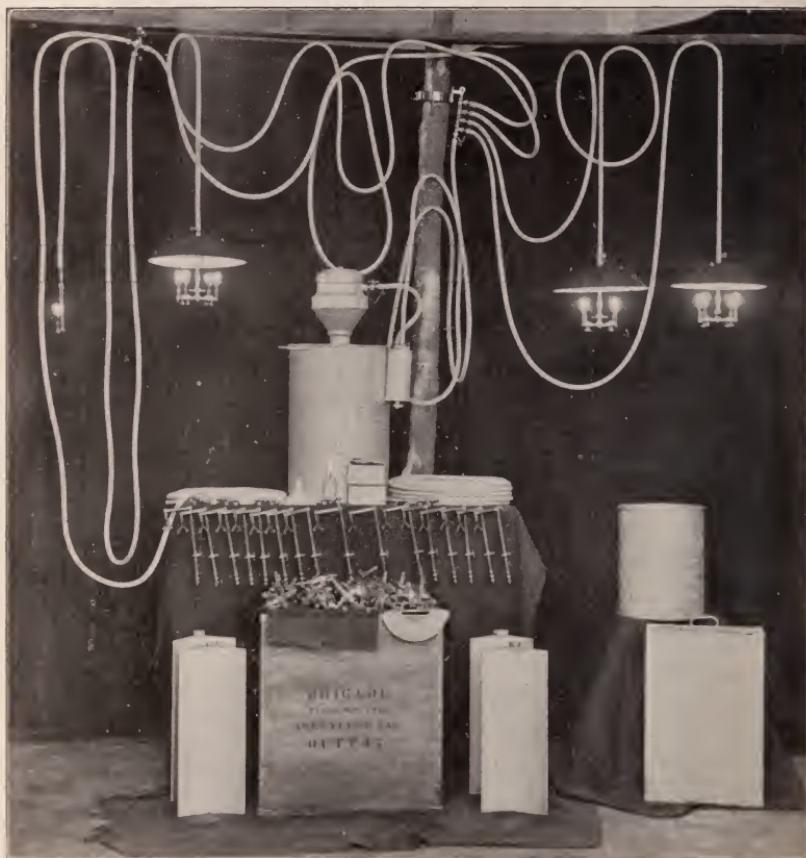
of the acetylene outfit, based on illuminating power, is sufficient to purchase somewhat more than an equivalent number of lanterns. The latter are, however, more liable to loss and breakage. Compared with the consumption of mineral oil by the regulation lanterns, and the light derived therefrom, the Quartermaster authorities state that a 12-candle power lantern uses two ounces of mineral oil hourly, or equivalent to four ounces of oil per hour for an illumination of 25 candle power. With oil at 8 cents per gallon, the cost is thus 0.34 cent per hour — or forty per cent. greater than with acetylene for the same amount of light.

Some have questioned the use of acetylene in the field, on the ground that it was necessary to carry a supply of calcium carbide with the command in order to render the apparatus of use. This is an objection which applies equally to mineral oil, candles, ammunition, rations, clothing, or any other



Regimental field hospital acetylene illuminating outfit, unpacked for display.

article forming part of the equipment of the soldier. As compared with mineral oil, calcium carbide occupies only one-fourth the space, considering the light obtained. Allowing four ounces of mineral oil to produce 25 candle power light in lanterns hourly, one gallon of oil, occupying a cubic space of 231 cubic inches,



Daylight photograph of brigade field hospital acetylene illuminating outfit, unpacked for display.

In addition to the three operating lights shown in the photograph, the generator is capable of running the ward drop burners displayed on the front of the table.

would be sufficient for 32 hours; while ten pounds of calcium carbide occupy but 225 cubic inches, and would yield 50 cubic feet of acetylene gas capable of running a 25 candle-power light for 100 hours. From the standpoint of transportation, acetylene illumination in field hospitals is thus much to be preferred to that from mineral oil.



Photograph of office tent of the U.S. Army brigade field hospital, Pan American Exposition, taken at night by acetylene illumination from a double drop burner.

The shortness of the exposure is evidenced by the flight of rockets shown above the tent. The small generator, regimental hospital size, is shown underneath the field desk. An operating cluster of four burners could, in addition, be run by this generator.

The regimental field hospital acetylene illuminating outfit is packed in its entirety in an oaken, brass-bound chest $16\frac{1}{2}$ inches high and $11\frac{1}{4}$ inches square on the base. The weight of the outfit complete, including a supply of calcium carbide sufficient to operate the apparatus for five nights, is about 50 pounds. The parts of this outfit, as shown in the accompanying photograph, are as follows: 4 canisters for calcium carbide; rubber distributing tube, 50 feet; 1 water bucket, with handle; 6 extra acetylene burner tips; 1 metal can, for holding extra parts; carbide magazine, automatic feed; extra rubber diaphragm; 1 operating cluster of 4 burners, with reflector; 1 dryer and filter; 2 pieces of felt, extra; 1 single drop burner; 1 funnel; 1 gas-bell; pincers; 3 distributing pipes, two- and three-way; 1 water container; 1 tube of white lead.

The above list appears very extensive from the number of individual articles named; but as a matter of fact they can be packed with great ease and rapidity. All the smaller articles are not liable to injury and are packed by being simply dropped together into the metal container, which in turn is covered with a lid and set into the water bucket. The latter is set into the water container; and outside the water-bucket but inside the water container is placed the gas-bell, into the top of which the carbide feed magazine has previously been screwed in an inverted position. The whole is then lifted up and placed in the wooden chest, the excess space in the corners of which are occupied by four reservoirs containing a reserve supply of calcium carbide sufficient to operate the apparatus for five nights. The rubber tubing for the distribution of the gas is then coiled around the top of the gas-bell, inside the water container, and the chest closed.

The brigade field hospital acetylene illuminating outfit is packed in its entirety, together with a supply of calcium carbide sufficient to operate the apparatus for five nights, in a brass-bound oaken chest weighing about 140 pounds and being 20 inches long, $14\frac{1}{2}$ inches wide and $21\frac{1}{2}$ inches high. The parts of this apparatus, as shown in the accompanying photograph, are practically the same as in the regimental outfit, except that they are of larger size. Of course, more burners, sections of junction pipe, and feet of rubber tube are provided





in this larger outfit. The method of packing is much the same as with the smaller chest, but the small parts go in a single container which rests in the chest beside the generator, while the space thus gained inside the latter is utilized to contain the larger amount of rubber distributing tube required.

In character, the generators for both the regimental and brigade field hospitals are practically the same except in size, and differ otherwise only in a few minor features. Briefly, the generator consists of an outside metal can or water container, in which is placed a metal water-bucket having a diameter about an inch less than the inner diameter of the outer can. The inner bucket is provided with a wire bail for convenience in handling. When ready for operation, this bucket is nearly filled with water and the space between it and the outside can is also filled with water to within two or three inches of the top of the former. Placed over the inside bucket, so that a water seal is formed by the water between the inner and outer buckets, is the gas-bell, tapering at the top where the carbide feed magazine is screwed into it. The latter is top-shaped, and is closed at the bottom with a metal plug connected by a shaft with the metal plate forming the top of the carbide magazine. This metal plate is attached to the magazine by a rubber diaphragm, so that it may oscillate up and down, and when so moving it pushes down and pulls up the plug in the bottom of the magazine—allowing pulverized calcium carbide to sift through the opening in the latter or closing off the supply, as the case may be. The operation of the apparatus is as follows:

The magazine being filled with calcium carbide through the opening in the top, gravity causes the plug in the bottom of the magazine to fall, allowing a pinch of carbide to sift down from the magazine into the water, on meeting with which there is an immediate decomposition with the evolution of acetylene gas. This causes an increase of the internal pressure in the generator, the gas passes up through the space through which the carbide is sifting and also through the hollow shaft connecting the plug and top plate of the magazine. This increase of the internal pressure forces the dia-

phragm upward, which by this movement pulls up the plug snugly into the aperture in the bottom of the carbide magazine and prevents the passage of any more carbide into the water reservoir. The acetylene gas, escaping from the gas-bell through the carbide magazine, is filtered and dried by being passed through felt, and is then conducted through tubes to the point where illumination is required. As the gas is used, the interior pressure in the gas-bell is gradually diminished, until there comes a time when this internal pressure is no longer capable of supporting against gravity the weight of the diaphragm and its attachments. As the diaphragm falls, the plug closing the bottom of the magazine is moved downward, a little carbide sifts through into the water, acetylene gas is formed, the internal pressure rises and operates to shut off the admission to the water of any more carbide. The whole operation is thus automatic—the carbide being decomposed in the production of acetylene gas only as fast as the latter is utilized. If no lights are burned, the operation of the apparatus is brought to a standstill; if ten lights are burned, the carbide is allowed to pass into the water reservoir at a rate ten times faster than if only a single light were in operation. There is thus no wastage of carbide under any circumstances, and at the same time there is no over-generation of gas. As with lanterns, the length of the period during which the apparatus will give light without recharging depends upon the amount of the illuminant burned. There is a limit to the amount of oil contained in a lantern and to the calcium carbide placed in an acetylene generator, and this limit is reached more or less rapidly as a greater or less number of burners are supplied from a single apparatus. The number of pounds of calcium carbide in the generator, multiplied by 5 (the number of cubic feet of acetylene gas one pound of carbide will produce) and multiplied by 2 where $\frac{1}{2}$ foot burners are used, equals the number of 25 candle-power hours. The regimental outfit thus contains 2 pounds of carbide, which yield 10 cubic feet of gas, which will run an operating cluster of 4 burners, of 25 candle power each and each requiring $\frac{1}{2}$ foot of gas per hour, for 5 hours—or it will run a single burner of 25 candle power for 20 hours. The intention of the writer in getting up the outfits was not to make the generators unnecessarily large, but to make them of such

a size as would keep them very portable and still have sufficient power to meet *all or any* of the needs of field surgery and the *necessary* requirements of field hospitals. To increase the size and weight of the apparatus beyond a certain point simply means that no apparatus at all could be carried in the field—but it is believed that very satisfactory outfits have been made within what may be fairly considered the maximum limits of weight and space for field conditions.

Accidents and explosions are impossible with the perfected type of generator adopted, for the gas pressure inside the apparatus can never be greater than that of a few inches of water composing the water-seal—in the regimental outfit the height of this column of water is but ten inches—and should a considerable quantity of carbide be dropped into the water intentionally or by a blow upon the top of the generator the only result would be that the sudden increase of the interior pressure would force out the water of the water-seal and cause it to spatter up over the gas-bell. The apparatus is thus not only simple in construction and operation but is absolutely safe. It is necessary to pass the gas through a felt filter to remove moisture and any minute particles of lime which may be carried up by the ascending gas, since otherwise this lime dust will collect at the burners and interfere with combustion, producing a smoky flame and a deposit of carbon, while the moisture may collect at the lower part of the distributing pipe and interfere with gas pressure.

The rubber distributing tube is carried from the generator along the ridge pole from tent to tent, being quickly fastened to the ridge pole at about the centre by a few turns of a thumb screw clamp, to the bottom of which is affixed a three-way pipe with stop-cocks. The two top pipes serve for the junction of the distributing tubes, while the third pipe serves for the attachment of a short drop tube with a single burner or operating light cluster. Screw clips hold the rubber and metal pipes together, and prevent their being pulled apart by gravity or accident. The apparatus can of course be set up and the lights distributed through a house as readily as through a tent hospital, if desired. Stop cocks shut off the supply of gas to any single burner, group of burners, or main distributing pipe.

With respect to the time, knowledge and care required to set up the field hospital illuminating outfits and keep them in operation, it may be safely said that the acetylene outfits can be unpacked, the junctions made, the tubing and burner distributed through the tents, and the whole apparatus put into full operation much sooner than would be the case if it was required to fill, trim and distribute lanterns of equal illuminating capacity. After the apparatus, tubes and fixtures are once in position, the only care required daily consists in refilling the carbide magazine, emptying out the bucket containing the milk of lime formed as a by-product in the generation of acetylene, and refilling the bucket with fresh water. The time required to recharge the apparatus and put it in a condition to operate for the following night need not exceed two or three minutes, or about the time required to clean, fill and trim a single lantern. The immense saving of time and labor by the use of acetylene in large field hospitals after the first installation of the apparatus, as compared with the use of lanterns, is thus a powerful argument in its favor. The packing up of an outfit is a somewhat longer task than putting it into operation, as care must be taken to coil the distributing pipe evenly so as to avoid kinks. The regimental field hospital outfit can readily be unpacked and put into operation, with one single drop burner and one operating cluster, in two or three minutes, but it cannot be properly taken to pieces and packed up under five or six minutes. The large outfit for a 108 bed hospital would of course require a proportionately longer time for making connections, distributing its pipe or for reassembling its parts for packing and transportation—but the whole matter even with the large outfit is one of a few minutes only.

In conclusion, the writer believes that the new portable acetylene field illuminating outfits proposed by him approach the ideal standards, formulated above, as nearly as may be in the present state of knowledge on the subject. He feels assured that their recent incorporation in the field hospital equipment of the Medical Department cannot but prove of very great advantage in the field surgery and hospital administration of the future.

Reprints and Translations.

THE REORGANIZATION OF THE BRITISH ARMY MEDICAL SERVICES.

THE much mooted reorganization of the British Royal Army Medical services is finally settled by a Royal Warrant recently promulgated to the Army with the approval of the Secretary of State for War, which we quote practically in full:

ARMY MEDICAL SERVICE.

WHEREAS WE deem it expedient to amend the Regulations relating to the Appointment, Promotion, Pay, and Non-effective Pay of Officers of our Army Medical Service:

OUR WILL AND PLEASURE is that the Warrant of Our late Royal Mother, dated the 26th October, 1900, shall be amended in accordance with the following provisions:—

The Director-General of Our Army Medical Service and the other officers of our Army Medical Staff shall hold the substantive rank of SURGEON-GENERAL.

The undermentioned officers shall rank as follows in relation to combatant officers for the purposes specified in the King's Regulations:—

AS LIEUTENANT-GENERAL	- - -	Surgeon-general holding the appointment of Director-General, Army Medical Service. } Chaplain-general. } Surgeon-general.
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In cases of distinguished service in the field a departmental officer may, with the concurrence of the Lords Commissioners of Our Treasury, be promoted from any rank or class to that next above it, and shall, if promoted to a rank or class having a fixed establishment, remain supernumerary in such rank or class until the occurrence of the vacancy to which, in the ordinary course, he would have been promoted.

An officer so promoted into a rank or class, with progressive rates of pay, shall not receive a further increase of pay in that rank or class until he becomes entitled thereto by service.

In a case of distinguished service in the field for which an officer may merit special reward, although there may not be sufficient grounds for his promotion, Our Secretary of State shall, if the officer is serving in a rank or class with progressive rates of pay and is not already in receipt of the highest rate, have the power, with the concurrence of the Lords Commissioners of Our Treasury, to grant him a higher rate of pay in his rank or class, but without alteration of his seniority.

APPOINTMENT.

Commissions as lieutenants in Our Royal Army Medical Corps shall be given, on the recommendation of our Commander-in-Chief, to persons duly qualified under regulations approved by Our Secretary of State. The commissions shall bear the date of the officers' appointment as lieutenants on probation.

Commissions as quartermasters in Our Royal Army Medical Corps shall be conferred upon warrant officers of that corps under certain specified conditions

SECONDED OFFICERS.

A lieutenant on probation who, at the time of passing the examination for admission to Our Royal Army Medical Corps, holds, or is about to hold, a resident appointment in a recognized civil hospital may be seconded for the period, not exceeding one year, during which he holds the appointment. While seconded he shall not receive pay from Army funds, but his service shall reckon towards promotion, increase of pay, gratuity, and pension.

PROMOTION.

An officer shall be eligible for promotion to the rank of captain on the completion of $3\frac{1}{2}$ years' service, and to the rank of major on the completion of 12 years' service, provided that in each case he has previously qualified in such manner as may be prescribed by Our Secretary of State.

Promotion to the rank of lieutenant-colonel shall be made

by selection from officers who have completed at least 20 years' service, and have qualified in such manner as may be prescribed by Our Secretary of State.

If an officer has passed with distinction the examination qualifying for promotion to the rank of major, the period of service required to render him eligible for the rank of major or lieutenant-colonel may be reduced as follows:

	Months.
If he obtained a "special certificate" - - - - -	18
If he passed in the 1st class - - - - -	12
If he passed in the 2nd class - - - - -	6
If he passed in the 3rd class.... - - - - -	3

A lieutenant in Our Royal Army Medical Corps, promoted to the rank of captain before the date of this Our Warrant, on account of distinguished service in the field, shall be eligible for further promotion to the rank of major, and subsequently to that of lieutenant-colonel, when the officer next below him in the rank of captain or major completes 12 or 20 years' service respectively. A captain so promoted to the rank of major shall, on the same conditions, be eligible for promotion to the rank of lieutenant-colonel.

An officer who may in the opinion of Our Secretary of State have been prevented, under very special circumstances, from qualifying for promotion, or who, having failed to qualify, may have been debarred from further opportunity of qualifying, may be provisionally promoted. If, however, he fails to qualify on the first available opportunity his promotion shall be cancelled, and he shall be retired from Our service.

An officer of Our Royal Army Medical Corps, who has exchanged or been transferred from Our Indian Military Forces shall reckon subject to conditions, his previous service with the said forces towards promotion, increase of pay, gratuity, and pension.

An officer of Our Royal Army Medical Corps shall be eligible for promotion to brevet rank.*

*Secretary of State's Instructions.—Distinction in original investigation or research may, in the case of an officer of the Royal Army Medical Corps, be regarded as "distinguished service of an exceptional nature other than in the field."

Promotion to the rank of colonel shall be made by selection from lieutenant-colonels who have been specially selected for increased pay, and from lieutenant-colonels, or surgeon-lieutenant-colonels of Our Household Troops, specially recommended to Our Secretary of State for distinguished service in the field.

Promotion to the rank of surgeon-general shall be made by selection from colonels.

A colonel may also be promoted to the rank of surgeon-general for distinguished service in the field.

The promotion of an officer for distinguished service in the field, shall be governed by specified conditions.

The appointment of director-general of Our Army Medical Service shall be for 3 years, unless the term is specially extended by Our Secretary of State for a further period not exceeding 2 years.

SUPERNUMERARY LIST.

An officer who does not qualify for promotion to the rank of captain or major, within periods specified shall be placed on the supernumerary list until he qualifies or is retired from Our Service under specified conditions. Service on the supernumerary list shall not reckon towards promotion, increase of pay, gratuity, or pension.

KING'S HONORARY PHYSICIANS AND HONORARY SURGEONS.

Six of the most meritorious officers of Our Army Medical Service shall be named Our Honorary Physicians, and six Our Honorary Surgeons. On appointment as one of Our Honorary Physicians or Honorary Surgeons, an officer under the rank of colonel in Our Royal Army Medical Corps may be promoted to the brevet rank of colonel.

EXCHANGES AND TRANSFERS.

An officer of Our Royal Army Medical Corps shall be permitted to exchange with another officer of such corps, or with a medical officer of Our Household Troops, under such conditions and regulations as may from time to time be made by Us.

Exchanges between officers of Our Royal Army Medical Corps under the rank of major and medical officers of Our Indian Military Forces, and transfers of such officers from either of the above services to the other, shall only be permitted

subject to the approval of Our Secretary of State for India in Council, and on the following conditions:

- (1.) That the officers have less than 7 years' service.
- (2.) That the senior officer exchanging takes the place of the junior on the list, and shall not be promoted until the officer next above him has been so promoted.
- (3.) That the junior officer exchanging is placed for seniority next below all medical officers whose commissions have the same date as his own.
- (4.) That the officer transferred is placed for seniority below all medical officers holding the same rank at the time of his transfer, and shall not be promoted until the officer next above him has been promoted.

PAY, ADDITIONAL PAY, AND CHARGE PAY.

The following shall be the rates of pay, additional pay, and charge pay of the officers of Our Army Medical Staff and Royal Army Medical Corps, etc.

	Inclusive of all Allowances except Field and Traveling Allowances.	Yearly.	Daily.	The pay of his rank. As a quartermaster of infantry.
ARMY MEDICAL SERVICE. <i>At Headquarters.</i>				
DIRECTOR-GENERAL - - - - -		£ 2,000	£ 3 0 0	
DEPUTY DIRECTOR-GENERAL - - - - -		1,500	2 0 0	
ASSISTANT DIRECTOR-GENERAL - - - - -		850	1 10 0	
DEPUTY ASSISTANT DIRECTOR-GENERAL - - - - -		750	0 15 6	
	Exclusive of Allowances.			
<i>At other Stations.</i>				
SURGEON-GENERAL - - - - -		£ 3 0 0	0 17 0	
COLONEL - - - - -		2 0 0	1 15 6	
LIEUTENANT-COLONEL - - - - -		1 10 0	1 3 6	
LIEUTENANT-COLONEL specially selected for increased pay after at least 8 years service abroad.			1 6 0	
MAJOR - - - - -			0 15 6	
After 3 years' service as such - - - - -			0 17 0	
CAPTAIN - - - - -			1 1 0	
After 7 years' total full pay service - - - - -			0 14 0	
After 10 years' total full pay service - - - - -				
LIEUTENANT ON PROBATION AND LIEUTENANT ADJUTANT of Our Royal Army Medical Corps (Volunteer)				
QUARTERMASTER - - - - -				

A lieutenant-colonel appointed one of Our Honorary Physicians or Honorary Surgeons, shall receive pay at the rate laid down for a colonel of Our Royal Army Medical Corps when qualified for promotion to that rank.

A captain of Our Royal Army Medical Corps holding the brevet rank of major shall receive pay at 2s. a day in addition to the rates laid down for a captain.

Additional Pay.

Officer not serving on the headquarters staff appointed a member of the Advisory Board	£150 a-year.
Officer serving as Secretary of the Advisory Board and Nursing Board - - - -	£100 a-year. s. d. Daily
Officer under the rank of lieutenant-colonel holding an appointment as specialist - -	2 6
Quartermaster in charge of the medical stores at Woolwich - - - - -	2 6

Charge Pay.

(a) Officer in charge of a general or other hospital; or of a division of a general hospital—

	s. d. Daily.
If in charge of at least 50 beds - - - -	2 6
" " 100 " - - - -	5 0
" " 200 " - - - -	7 6
" " 300 " - - - -	10 0

(b) Officer in command of the depot, Royal Army Medical Corps - - - - - 5 0

(c) The senior officer of Our Army Medical Service with an army in the field—

A rate to be fixed by Our Secretary of State according to the magnitude of the charge.

(d) In a command abroad— s. d.
The senior medical officer, if the number
of soldiers is 1,500 or upwards - 5 0

EXTRA-DUTY PAY.

An officer of Our Royal Army Medical Corps, appointed to act as adjutant or quarter-master of Our Royal Army Medi-

cal Corps (Militia) during preliminary drill or training, shall receive extra-duty pay at the following daily rates:—

	s.	d.
Acting adjutant	-	2 6
Acting Quartermaster	-	2 0

RESERVE OF OFFICERS.

On the completion of 3 years' service, an officer of Our Royal Army Medical Corps may be permitted by our Secretary of State to become an Army Reserve officer for a period of 7 years; and while so serving he shall receive pay at the rate of £25 a year.

With the sanction of Our Secretary of State, such officer may be allowed to return to the active list, and if the period he has been in Our Reserve of Officers amounts to at least 1 year, and not more than 3 years, he shall be allowed to reckon one-third of such period towards promotion, gratuity and pension.

PAY DURING SICK LEAVE.

An officer of Our Army Medical Staff or Royal Army Medical Corps may be allowed full pay during sick leave of absence.

MEDICAL OFFICERS OF THE REGIMENTS OF HOUSEHOLD TROOPS.

Appointment.

A major or lieutenant-colonel of Our Royal Army Medical Corps may, on the nomination of the titular colonel of the regiment, be transferred from his corps into the rank of surgeon-major or surgeon-lieutenant-colonel respectively in one of Our regiments of Household Troops.

Promotion.

A surgeon-major shall be eligible for promotion to the rank of surgeon-lieutenant-colonel on completing 20 years' service, provided that he has previously qualified in such manner as may be prescribed by Our Secretary of State.

Promotion to the rank of brigade-surgeon-lieutenant-colonel shall be made by seniority on the medical establishment of the brigade.

A surgeon-major may be promoted to the rank of surgeon-

lieutenant-colonel for distinguished service in the field, under specific conditions.

Exchanges.

A medical officer of Our Household Troops may be permitted to exchange with an officer of Our Royal Army Medical Corps, provided that an officer exchanging into Our Royal Army Medical Corps has fulfilled any conditions as to service abroad required of officers of such corps.

Pay.

The rates of pay of medical officers of Our Household Troops shall be as follows:—

	£ s. d.
Brigade-surgeon-lieutenant-colonel	1 15 0
Surgeon-lieutenant-colonel	1 10 0
Surgeon-Major	1 3 6
After 3 years' service as such	1 6 0

A medical officer of Our Household Troops shall be eligible for extra pay.

General Regulations.

In all matters not provided for the medical officers of Our Household Troops shall be governed by the general regulations for regimental officers of Our Army.

RETIREMENT.

(a.) *Voluntary Retirement.*

CONDITIONS OF RETIREMENT.

An Officer of Our Army Medical Service, or a medical officer of Our Royal Malta Artillery, may be permitted to retire, in cases in which such retirement may be deemed expedient by Our Secretary of State.

SCALE OF RETIRED PAY.

Army Medical Staff.

	Daily.
SURGEON-GENERAL	£ s. d. 2 0 0
Royal Army Medical Corps and Medical Officers of Household Troops.	
COLONEL	1 15 0
LIEUTENANT-COLONEL, or Surgeon-lieutenant-colonel of the Household Troops—	
After 20 years' service	1 0 0
" 25 "	1 2 6
" 30 "	1 5 0

LIEUTENANT-COLONEL, after having been in receipt £ s. d. of the increased pay allowed for 3 years, or brigade-surgeon-lieutenant-colonel of the Household Troops—

Under 30 years service	- - - - -	1	7	6
After 30 "	- - - - -	1	10	0

MAJOR, or surgeon-major of the Household troops—

After 20 years' service	- - - - -	1	0	0
After 25 years' service, if his service reckoning for promotion is insufficient to qualify him for promotion to the rank of lieutenant-colonel	- - - - -	1	2	6

Gratuity.

MAJOR OR CAPTAIN—

After 5 years' service in the rank of captain,	- - - - -	1,000
<i>After 10 years' service, if the officer was commissioned before the date of this Our Warrant</i>	- - - - -	1,250
After 3 years' service in the rank of major, or, if the officer was commissioned before the date of this Our Warrant, after 15 years' service	- - - - -	1,800
After 6 years' service in the rank of major, or, if the officer was commissioned before the date of this Our Warrant, after 18 years' service	- - - - -	2,500

Surgeon-lieutenant-colonel or surgeon-major of the Household Troops—

After 15 years' service	- - - - -	1,800
" 18 "	- - - - -	2,500

Medical Officers of the Royal Malta Artillery.

All ranks—retired pay equal to the half-pay of the officers' rank.

Except in the case of a lieutenant-colonel, an officer of Our Army Medical Service, who, on voluntary retirement, has served for less than 3 years in the rank from which he retires, shall be entitled only to the gratuity or retired pay assigned to the next lower rank.

(b) Retirement on account of Age, or Limitation of Period of Service.

CONDITIONS OF RETIREMENT.

The Director-General of Our Army Medical Service shall retire on completion of the term of his appointment; and the retirement of other officers of Our Army Medical Service (ex-

cept quartermasters) shall be compulsory at the following ages:

Surgeon-general	- - - - -	60
Colonel, <i>promoted to the rank on or after the date of this Our Warrant</i>	- - - - -	57
Colonel, <i>promoted to the rank before the date of this Our Warrant</i>	- - - - -	60
Other officers	- - - - -	55

A major shall retire on completion of 25 years' service; or, if he fails to qualify for promotion, on the completion of 20 years' service.

A captain or lieutenant shall retire on completing 6 months' service on the supernumerary list.

A medical officer of Our Royal Malta Artillery shall be compulsorily retired on attaining the age of 55.

It shall be competent to Our Secretary of State to place a medical officer on the retired list after 30 years' service.

SCALE OF RETIRED PAY.

DIRECTOR-GENERAL ARMY MEDICAL SERVICE.—After three years' service as director general—with 30 years service £1,125 yearly.

OTHER OFFICERS OF OUR ARMY MEDICAL SERVICE AND MEDICAL OFFICERS OF OUR ROYAL MALTA ARTILLERY.—Same rates as under “(a) VOLUNTARY RETIREMENT,” except that the condition of 3 years' service in the rank shall be omitted, and that, in the case of a surgeon major of Our Royal Malta Artillery, his retired pay, if retired on account of age, shall be 17s. 6d. a day, irrespective of service.

(c) Retirement on Account of Medical Unfitness.

CONDITIONS OF RETIREMENT.

An officer of Our Army Medical Service, or a medical officer of Our Royal Malta Artillery placed on the half-pay list on account of medical unfitness shall, if not previously retired, be retired from Our Army at the expiration of 5 years from the date on which he was placed on the half-pay list, or, if reported by the regulated medical authority to be permanently unfit for duty, on the officer's application, at such earlier date as may be decided by Our Secretary of State.

An officer, whether on full or half pay, placed in detention as a person of unsound mind, shall be retired from Our Army, with the retired pay to which he would be entitled if reported by the regulated medical authority to be permanently unfit for duty. If his disability was not caused by military service, and he is not entitled to permanent retired pay by length of service, he shall receive temporary retired pay equivalent to the half-pay, and temporary retired pay, if any, which he would have received if his disability had been other than insanity.

SCALE OF RETIRED PAY.

DIRECTOR-GENERAL ARMY MEDICAL SERVICE.—Under 3 years' service as director-general, and after not less than 30 years' service, £875 yearly.

OTHER OFFICERS OF OUR ARMY MEDICAL SERVICE AND OF OUR ROYAL MALTA ARTILLERY.—Same rates as under “(a) VOLUNTARY RETIREMENT,” except that the condition of 3 years’ service in the rank shall be omitted; and that in the case of a surgeon-major of Our Royal Malta Artillery his retired pay, if retired on account of medical unfitness, shall be 17s. 6d. per day, irrespective of service.

Rates for Officers not Qualified for Retired Pay on Voluntary Retirement.

If the unfitness was caused by military service—retired pay equal to the half-pay of his rank.

If not so caused; provided the officer has at least 12 years' service—retired pay equal to the half-pay of his rank, for such period only, not exceeding 5 years from the date of the officer's retirement from Our Army, after 5 years on half-pay under *Article 306, as Our Secretary of State shall determine according to the merits of the case.

Given at Our Court at - - - this 24th day of March 1902, in the 2nd year of Our Reign.

By His Majesty's Command.

Secretary of State's Instructions.

The term “rank” when used in the foregoing Royal Warrant, means “substantive rank” unless otherwise stated.

*The numbers of the articles and the references to other articles, except in the present instance have been omitted in this reprint.

Officers who have served with the Royal Army Medical Corps (Militia) when embodied, or who, as officers of the Royal Army Medical Corps (Militia) or Royal Army Medical Corps (Volunteers), medical officers of Yeomanry or Volunteers, or as civil surgeons, served with an army in the field, after the 1st October, 1899, may be allowed to reckon such service toward retired pay and gratuity.

Commander-in-Chief.

COMMENT BY THE BRITISH MEDICAL JOURNAL.

It must be admitted that on first reading it is a somewhat disappointing document, for there is no reference to be found in it to several of the points as to which definite information is most eagerly looked for by the Service and by young members of the profession who are thinking of the army as a possible career. The details as to the various examinations to be passed for entrance and promotion are not yet forthcoming. Nothing is said as to any projected increase in the strength of the Royal Army Medical Corps, and the vital question of Indian pay is not touched upon. The explanation of this latter omission is, we understand, that in a legislative sense India lies outside the scope of Royal Warrants. The regulations as to examinations, with which the question of study leave is bound up, will, we believe, be published at once. The provision of a remedy for the present undermanned condition of the Corps, and the proposal that junior officers should for the first few years of their service be attached to regiments are, we presume, among the matters which are left to the discretion of the Secretary of State for War. It will be noted, further, that no mention is made of the Advisory Board, which has been in active existence for some months. That body, in fact, would appear to resemble the Cabinet, which theoretically has no place in the British Constitution.

It is impossible here to give a critical analysis of the Articles of the Warrant. And until the fullest information has been furnished as to matters not dealt with in the Warrant, it would be rash, and might be misleading, to express a definitive judgement on the value of the scheme of reorgani-

zation of the Army Medical Services as a whole. All that can profitably be done at the present stage is to give a rapid summary of the more important points of the document before us. For the sake of convenience we follow the order of the Warrant, though the Articles might have been more logically arranged.

As regards rank, the Director-General is to be the equal of a Lieutenant-General, instead of a Major-General as heretofore. But this advance in title only partially expresses the higher position in the military hierarchy to which the Director-General has been raised. He is now placed on an absolutely equal footing with the heads of departments on the headquarters staff. In the *Monthly Army List* for March the office of the Director-General of the Army Medical Service is printed in the same type as is used for those of the Director General of Mobilization and Military Intelligence, the Adjutant-General to the Forces, the Quarter-master-General to the Forces, the Inspector-General of Fortifications, and the Director-General of Ordnance. This question of typography may appear trivial, but to the military mind the promotion from "pearl" to "long primer" has a world of meaning. The Director-General is now a member of the War Office Council, and also of the Army Board. The head of the Army Medical Service has now, therefore, a position in the army corresponding to the dignity of his office and to his responsibility. This in itself constitutes a reform of the most far-reaching importance.

Passing next to the other end of the scale of rank we are able to state positively, that the entrance examination is to be confined to clinical medicine and surgery. By this means it is hoped to secure a class of sound practical men, likely to make efficient officers, who would be deterred from offering themselves as candidates by disinclination to go through the drudgery of getting up the details of anatomy, physiology, and other elementary subjects. The commissions of officers entering the service are in future to bear the date of their appointment as lieutenants on probation; this means that the

time spent at Netley will be reckoned towards promotion, so that an officer may attain the rank of captain on the completion of three years and a-half service. In accordance with the principle of attracting a class of men who have hitherto been to a large extent kept out by the inelastic rules previously in force, candidates who at the time of passing the entrance examination hold or are about to hold resident appointments in civil hospitals may be seconded for the period during which they hold such appointments. The interminable vista of examinations for promotion which was so objectionable a feature in the scheme drawn up by Mr. Brodrick's "Committee of Experts" has been reduced to limits which need not terrify a well-trained medical officer, even if he has little taste for the "bookish theorick." For promotion to Captain a test in knowledge of the administrative duties of a medical officer is required. For promotion to Major an examination must be passed in medicine, surgery, hygiene, bacteriology, and one special subject selected by the candidate. If an officer passes this examination "with distinction" his promotion to the rank of Lieutenant-Colonel will be accelerated by a period varying from three to eighteen months; this period of service will count towards the pension to which the officer becomes entitled on retirement. For promotion to Lieutenant-Colonel an examination in military law and other administrative subjects must be passed. Beyond the rank of Lieutenant-Colonel promotion will be entirely by selection, or for distinguished service in the field.

A novel and very important point in the new warrant is that officers of the R.A.M.C. are now eligible for promotion to brevet rank as a reward for special service. Hitherto this system of promotion, which exists in the combatant ranks of the army, has been unknown in the Royal Army Medical Corps; hence a man could not be promoted for distinguished service except by passing over the heads of a certain number of officers, and thus inevitably creating a feeling of dissatisfaction among them. It is also satisfactory to note that in the case of an officer of the Royal Army Medical Corps regard

may be had to "distinguished service of an exceptional nature other than in the field," which may be held to qualify for selection for promotion to the rank of Colonel. Promotion to the rank of Surgeon-General is to be made from Colonels by selection or in recognition of distinguished service in the field.

In regard to pay, the proposals made in Mr. Brodrick's scheme have been generally adhered to. It will be noted that the titles of the headquarters Staff have been altered so as to assimilate them to those of the corresponding officers in the other departments of the War Office. The Surgeon Generals are not to receive consolidated pay as originally proposed. The increase of pay in all the other ranks except that of Colonel remain substantially as recommended. It may be mentioned that a brevet Major gets 2s. a day in addition to his captain's pay. Officers who qualify as "specialists" in obstetrics, ophthalmology, laryngology, and so forth receive 2s. 6d. a day in addition to the pay of their rank. Charge pay is given as in the scheme, but with this important modification, that it is to be drawn by officers in charge of a general or other hospital or of a division of a general hospital. The Senior Officer of the Medical Service with an army in the field will receive charge pay in accordance with the magnitude of his charge.

As regards retirement, the Director-General is appointed for a term of three years, which may be specially extended for a further period not exceeding two years. Surgeon-Generals are compulsorily retired at the age of 60; Colonels, if promoted to the rank on or after the date of the Warrant, at 57, or if before, at 60; other officers at 55. A Major must retire on completion of twenty-five years' service, or if he fails to qualify for promotion, after twenty years. This provision safeguards the pension of £1 a day to which so much importance is justly attached by the service. It was the ambiguity as to this essential point that more than anything else made Mr. Brodrick's original scheme unacceptable. Officers who do not qualify for promotion to the rank of Captain or Major at the proper time are to be placed on the supernumerary list

till they succeed in doing so; if they fail after six months' service on the supernumerary list they are to be compulsorily retired. The rates of retired pay of the various ranks and of gratuities to officers of the rank of Major are set forth in the Warrant; the only remark that need be made is that a gratuity of £1,000 is given after five years' service in the rank of Captain, making the total period required to qualify for the gratuity a little more than eight years.

These are the main features of the new Warrant. Our view of it may be conveyed in a paraphrase of the opinion of Falstaff's doctor about the fat knight's water. For the Warrant itself, it is a good Warrant—as far as it goes; but all depends on the spirit in which it is administered by the War Office. We have said that it is good “as far as it goes;” but it must be admitted that it does not go very far. Before we can honestly say that the Medical Service of the Army in its reorganized condition offers a fair career to young men who have in them the capacity for achieving professional success, we must have definite assurances that the strength of the Corps will be raised to a degree sufficient to allow a reasonable amount of leave to all officers, and that the long-standing grievance as to Indian pay will be removed. In this matter no vague promises, no optimistic trust in official statement will serve. The Indian Government, if it cannot be compelled by Royal Warrant to be equitable to medical officers, must have *force majeure* applied to it in some other way. Mr. Brodrick may take it from us that no scheme of reorganization of the Medical Services of the Army will be accepted by the profession which does not include provisions for the removal of this gross injustice—provisions that cannot by any official shuffling or obstinacy be evaded.

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Rear Admiral Presley Marion Rixey, Surgeon General United States Navy.

Editorial Department.

SURGEON GENERAL PRESLEY MARION RIXEY,
UNITED STATES NAVY.

THE inevitable change consequent upon the progress of time has brought to the head of the naval medical department one of its most distinguished and capable officers in the person of Rear Admiral Presley Marion Rixey, who was appointed Surgeon General on the tenth of last February. Admiral Rixey was born in Culpeper county, Virginia, on the fourteenth of July, 1852 and received his early education at schools in Culpeper and Warrenton. His family identified itself with the Confederate cause during the civil war which brought financial ruin upon its members in company with so large a proportion of our old southern families. Undaunted by difficulties, however, he sought and achieved an education, both general and professional, receiving the doctorate in medicine from the University of Virginia in 1873. He then undertook to extend his practical acquaintance with his profession by attendance upon clinics and hospitals in Philadelphia during the remainder of the year, presenting himself before the naval examining board early in 1874 as a candidate for appointment in the medical corps of the Navy.

He was commissioned Assistant Surgeon in the navy on the twenty-eighth of January, 1874 and set out upon that long period of service which has just been crowned with the highest honors attainable in his corps. He was first assigned to duty on the Receiving Ship "Sabine," but soon transferred to the "Congress," then on the European station and later at the Centennial Exposition at Philadelphia, where she represented the navy. He was detached in 1876 and ordered to the Philadelphia Naval Hospital where he remained until he passed

his examination for promotion to the grade of Passed Assistant Surgeon in 1877. He then took station at the Norfolk (Va.) Navy Yard as attending surgeon, where he served until assigned to a three years' tour of special duty on the "Tallepoosa" in 1879. He was on the flagship "Lancaster" from 1884 to 1887 on the European and South Atlantic Stations, and on the "Dolphin" from 1893 to 1896. During the Spanish war he applied for active sea duty, but his services were deemed so essential in Washington that he could be spared only to make a brief voyage to Cuba on the ambulance ship "Solace." The twelve years of service not enumerated above were passed on special duty as attending surgeon at Washington. In 1888 he was promoted to the grade of Surgeon and in 1900 to that of Medical Inspector.

During his long service in Washington he was honored with the confidence of many of the most prominent men of the country, and for the last three years was physician to the Executive Mansion. It was in especial recognition of the value of his distinguished services in the latter capacity that President McKinley promised him the surgeon-generalcy of the navy when the next vacancy should occur, a promise which President Roosevelt fulfilled. In connection with his duty at the Executive Mansion, it became necessary for him to accompany the President upon all journeys taken by the Chief Executive, and thus it happened that he was in Buffalo when President McKinley was assassinated. He had been detailed by the President to accompany Mrs. McKinley to the Milburn House, whilst he received the people, so that he was not immediately at hand when the President was shot, but was promptly summoned so that he was present and assisted with the operation, and took official charge of the case. Here he displayed in the highest degree those qualities which evidenced not only professional acquirements of an extensive range, but executive ability and diplomatic faculties of a remarkable character. The skill and devotion which he displayed in the management of the case of the President and the almost equally exacting case of the President's invalid wife won for him the admiration and affection of the entire country.

Admiral Rixey is a member of the American Medical Association and a member by invitation of the Washington (D. C.) Medical Society. He has been an active member of the Association of Military Surgeons since 1895, and during the present year has served as a member of the Executive Committee.

On the occasion of an explosion on the Spanish Caravel "Santa Maria" in the harbor of New York in 1893 he rendered prompt and generous assistance to the officers and crew of the vessel, a courtesy which the King of Spain, Alfonso XIII, recognized by decorating him with the Order of Naval Merit.

His thorough understanding of the needs of the service is evinced by his prompt application to Congress for a material increase in the number of his corps. His request is accompanied by evidence of the necessity for the desired action so convincing that there can be no doubt of favorable action upon it. The accession of Admiral Rixey augurs good fortune for the naval service and particularly for the medical department, which is sure to be developed and advanced by the sagacity, tact and ability which has characterized all the official acts of his successful career.

JAMES EVELYN PILCHER.

GREATER CARE IN INVESTIGATING THE ANTE-CEDENTS OF CANDIDATES FOR THE ARMY MEDICAL CORPS.

WHEN, some years ago, the Army Medical Examining Boards held their sessions in the large cities from which the majority of candidates for commissions in the Army Medical Corps were drawn, the members of the board made it a part of their duty to personally investigate the character, habits and professional standing in the community of the young men who presented themselves for examination. Later, the Army Medical Examining Board convened in Washington, the young men who appeared before it, were drawn from all sections of the country and this highly important personal investigation of their character and morals

could not be made. Under Army Regulations each candidate was of course obliged to present letters of recommendation from two reputable citizens, but such letters were easily to be obtained, and the Board was forced to base its estimate of the character of candidates almost wholly on the brief acquaintance gained during the course of the examinations. In 1898, Captain E. L. Munson, who was recorder of the Examining Board then in session, addressed letters of inquiry, with respect to all candidates, to the deans of the institutions from which they were graduated and also to the secretaries of the medical societies in the communities of which these candidates were resident, stating that any information received in reply would be held strictly confidential. This system of inquiry has been continued by the Surgeon General's office down to the present time and has resulted in much valuable information being received by the examining boards. In his present work as recorder of the examining board, which recently began its sessions, Captain Munson has extended this system so that a more complete knowledge of candidates can be secured. Army medical officers serving at posts or as attending surgeons in large cities will be required by letter from the Surgeon General's office to carefully investigate into the character of candidates resident in their vicinity and make report thereon. At places where no medical officers are stationed, the local recruiting officer will be asked to make this investigation and report. In addition, letters will be addressed to several medical officers of the National Guard, members of the Association of Military Surgeons, requesting them to make confidential reports to the Surgeon General as to the fitness of these candidates for commission in the Medical Department of the Army. Through these various channels it is expected that such full information will be gained that examining boards in the future need make no mistakes in their recommendation of candidates for appointment. The new plan has the further benefit of practically using the medical officers of the national guard as auxiliaries to the medical officers of the regular service and bringing them more

closely in touch with each other; and at the same time making the former practically stand sponsor for the character of the young medical men admitted to the Medical Corps of the Army.

PRESENT DAY MILITARY MEDICAL JOURNALS.

THE United States, while advanced in general journalism, unexcelled in medical journalism and at the front in military journalism, has allowed itself to be surpassed in military medical journalism for many years. During more than a quarter of a century the Swedish Association of Military Surgeons has been ably represented by its *Tidskrift* while for a decade the Japanese Association of Military Surgeons has regularly issued its *Gun Igaku Kwai Zasshi*, bearing to its members at frequent intervals the best work of the medico-military profession of the world.

The JOURNAL OF THE ASSOCIATION OF MILITARY SURGEONS has many precedents to justify its existence, for military medical journalism was not slow to present itself even in the infancy of periodical publication. At the present time every important country with the exception of England has its journal devoted to medico-military science.

The *Archives de médecine et de pharmacie militaires* (Paris, France) published by order of the French Minister of War is a thin octavo (9x5½ inches, untrimmed) in a dark blue cover, now in its thirty-ninth volume and twentieth year of publication under its present form, although its entire history dates much farther back to the time when in 1815-16 it was issued as the *Journal de médecine, de chirurgie et de pharmacie militaires*, changing in 1817 to the *Recueil de mémoires de médecine, de chirurgie et de pharmacie militaires*, which style it retained until 1882 when it took on its present form,—making a total period publication of eighty-eight years, during which it has contributed enormously to the advancement of French military medicine.

The *Archives de médecine navale*, the naval equivalent of

the *Archives de médecine et de pharmacie militaires* is published by order of the Minister of Marine, and is now in its sixty seventh semi-annual volume of about 480 pages. It is of octavo size (9x5½ inches, untrimmed) and published monthly.

In addition to the foregoing official medico-military journals, published directly under governmental supervision, the French have a non-official journal, *Le Caducée*, a semi-monthly quarto (13x9½ inches, untrimmed) to which we have already referred somewhat at length. *Le Caducée* makes a special feature of abstracts of articles relating to military medicine which have appeared in other periodicals, and is a particularly bright and progressive journal.

The *Giornale Medico del Regio Esercito* is a monthly of about a hundred pages published under the supervision of the Italian War Ministry at Rome at 12 lire per annum. It is an octavo (8¼x5½ inches, trimmed) and is now in its forty-ninth year of publication. Its contents are not restricted to technically military medical subjects, which indeed are rather conspicuous by their absence, and it is evidently designed to take the place occupied by the general medical journals in the repertory of the American military surgeon.

The *Annali di Medicina Navale* is a handsome journal published under the official patronage of the Italian Minister of Marine also at Rome. It is now in its eighth year and its fifteenth volume of six numbers, each numbering about 150 pages. Like its analogue of the War department, it is not technically military but covers the field of medicine in general.

The *Deutsche Militärärztliche Zeitschrift* of Berlin was established in 1872 and is now in its thirtieth year of successful publication. It is a monthly, octavo (9¾x6½ inches, untrimmed) of fifty-six pages with a monthly supplement of official orders and changes of station. Its senior editor, Dr. von Leuthold has just been appointed surgeon general of the German army in place of the lamented von Coler. It is distinctly official in character and is one of the chief instruments which the German military organization so judiciously employs in the work of developing the efficiency of the medical department of its mighty military system.

The *Militäärarzt* is a semi-monthly supplement to the *Wiener medizinische Wochenschrift* and appears in 8 page quarto (13x9½ inches) form. It is now in the thirty-fifth year of publication, devoted to the elevation of Austrian military medicine. A similar *beilage* was for many years furnished to the subscribers to the *Wiener medizinische Presse*, the other great Vienna medical weekly, but the writer is unable to state whether it is still issued or not.

Das Rothe Kreuz is not strictly a military medical journal but its importance in first aid work brings it into close contact with military administration. It is a quarto (12¼x9¼ inches) of twenty pages and has been published in Berlin for nineteen years.

The Slav is active in medical journalism and the *Voyenno meditsinski Journal* of St. Petersburg is a large octavo (10x6½ inches, untrimmed), which has a history dating back to 1823. Numerous references to its contents are found in our Medico-Military Index, showing the practical and useful character of the matter regularly furnished to its readers.

The *Archives médicales belges, organe du corps sanitaire de l'armée*, published at Brussels, is now in its fifty-fifth year. It is a monthly octavo (8½x5½ inches, untrimmed) of about eighty pages per number, well edited and well written, showing that a distinctly progressive character marks the work of the Belgian military surgeon.

The *Militair-Geneeskundig Tijdschrift* of Haarlem is the organ of the medical officers of the Dutch army. It is edited by a strong editorial committee, composed of officers of the military and naval services, and has department editors in charge of military surgery, military hygiene, naval medicine, tropical affections, military pharmacy, veterinary practice, red cross work, etc. It was established in 1897 and is published in octavo (9½x6½ inches, untrimmed) quarterly numbers of about 64 pages each.

The *Tidskrift i Militär Hälsovård*, the organ of the Swedish Association of Military Surgeons, is an attractive octavo (9x5¾ inches, untrimmed), issued quarterly at Stockholm. It

has been a most important factor during the twenty-six years of its publication, in achieving for the military surgeons of Sweden the strong position and high reputation which they enjoy. It is excellently arranged, carefully edited and furnishes about 500 pages of text each year.

The *Finsk Militär Tidskrift*, published at Helsingfors accomplishes for the military forces of Finland what has been undertaken by the Norwegian and Swedish journals for other Scandinavian territory.

The *Norsk Tidskrift for Militär Medicin* is another example of the progressive character of Scandinavian military medicine. It is published in Kristiania under the direction of Lieutenant General Thaulow, surgeon general of the army and navy of Norway, and edited by Captain Daal, an accomplished officer of his staff.

The *Gun Igaku Kwai Zasshi*, which may be translated as *Journal of the Association of Military Surgeons of Japan*, is a handsome octavo (8½x5¾ inches, trimmed) which has now been published for ten years in Japanese text. It is an index to the high grade of work done by our oriental confreres and an encouragement to the further persistent development of the Journal of our own Association.

La Medicina Militar Española, y Revista de clínica y de terapéutica y farmacia of Madrid, a semi-monthly octavo (9¼x6½ inches, untrimmed) of 16 pages, now in the twenty-seventh year of its publication, is the representative of the medical officers of the Spanish army and deals very largely with tropical affections.

The *Revista de Sanidad Militar* is "a publication devoted to the scientific and professional interests of the Spanish Military Sanitary Corps" and is now in its sixteenth volume. It is issued semi-monthly as an octavo (9½x6½ inches, untrimmed) of about twenty pages, and is also published at Madrid. A feature of this journal is a *feuilleton*, individually paged to form a separate book upon its completion. The series goes under the general title of "Biblioteca de la Revista de Sanidad militar." The subject of the present serial is a General



The Military Medical Journals of 1902.

1. Deutsch Militaeraerztliche, Zeitschrift.
2. Le Caducée.
3. Annali di Medicina Navale.
4. Tidskrift i Militär Halsovard.
5. La Medicina Militar Espanola.
6. Indian Medical Gazette.
7. Giornale Medico del Regio Esercito.
8. Voyenno meditsinski Journal.
9. Journal Military Surgeons, United States.
10. Archives de medecine et de pharmacie militaires.
11. Der Militaerarzt.
12. Das Rothe Kreuz.
13. Revista de Sanidad Militar.
14. Anales de Sanidad Militar.
15. Gun Igaku Kwai Zasshi.
16. Archives de medecine navale.
17. Militair-Geneeskundig Tijdschrift.
18. Archives medicale belges.

Study of the Fractures produced by the Projectiles of Small Arms, by Dr. Miguel Slocker de la Pola.

The *Anales de Sanidad Militar* of Buenos Aires is a monthly octavo (6x8½ inches trimmed) of about a hundred pages, with an imposing editorial corps and a subscription price of one peso per month. It is now in its third year of publication.

The *Bulletin International des sociétés de la croix-rouge*, published by the *comité international*, of which M. Gustave Moynier is president, at Geneva, is an octavo (9x6 inches, trimmed) issued quarterly. It presents about 64 pages in each number, of matter bearing mainly upon military medical administration enclosed between handsome covers of red and white.

The *Indian Medical Gazette*, while not a professedly military medical journal is edited by officers of the British Indian Medical service and appeals largely to the officers of that service, who in turn contribute freely to its interesting and valuable pages, so that it is actually more military in its character than some of the self-declared medico-military publications. It is one of the most valuable of the series.

It will be seen then that the JOURNAL OF THE ASSOCIATION OF MILITARY SURGEONS OF THE UNITED STATES, far from being unique in its character and aims, is only one of a large number of publications with similar purposes, which have been published for from four to four score years, forming for us a history of military medicine, which is ever worthy to be studied.

THE ARMY MEDICAL SCHOOL.

THE sessions of the Army Medical School, after an unavoidable suspension of four years, on account of the demands of the Spanish war and the Philippine hostilities, were resumed last fall and at the Commencement last month the largest class in its history was graduated. The principal feature of the occasion was the address by General Sternberg, the founder of the institution, upon its functions. After emphasizing the signal and too often unrecognized im-

portance of the work of the medical officer in maintaining the combatant efficiency of an army, he commented upon the agency of the army medical school in preparing its graduates for authoritative recommendations with regard to the avoidance and suppression of those diseases which have been found by experience to present the greatest dangers as regards the health of troops and the efficiency of armies.

"The measures," he remarked, "to be taken for the prevention of disease among our soldiers naturally fall under two principal headings, viz: (a) Those which relate to the maintenance of a high standard of resisting power on the part of the individual army; and which relate of these in- from infec- of the vari- germs, which proved by ex- be the prin- of sickness ity among der the first have to con- clothing, and heating

(b) those to protection individuals tion by any ous disease have been perience to cipal causes and mortal- soldiers. Un- heading we sider food, ventilation



The Hoff Memorial Medal.

of barracks, exercise, etc. The second involves a precise knowledge of the morphological and biological characters of all known disease germs, of the mode in which they gain access to the human body, and of the best means of destroying them. * * * We now know that disease germs are not disseminated through the atmosphere of infected localities, and, having precise knowledge of where to find them and how to kill them, are able to formulate directions for the prevention of those pestilential diseases which, if fully carried out, would no doubt lead to their utter extinction. We have a recent example of the im-

portance of precise knowledge with reference to the mode of transmission of an infectious disease as a basis for measures of prophylaxis, in the discovery that yellow fever is transmitted by mosquitoes of the genus *Stegomyia*." After alluding to other recent discoveries in connection with infection he continued by referring to the fact that the student officers "learn to recognize the various disease germs by the use of the microscope and of culture methods; they learn to differentiate between the mosquito that serves as an intermediate host for the germ of malarial fever and of yellow fever; they are instructed as to the best methods of destroying these pernicious insects or of protecting soldiers from infection through their stings; they learn to detect the presence of pathogenic microorganisms or of injurious inorganic impurities in drinking water; they learn to make an early diagnosis in malarial fever, typhoid fever, bubonic plague, diphtheria, etc., by use of scientific methods," some of them of very recent discovery. He impressed upon the class the important opportunities for investigation opening up before them, suggesting as questions for study: "What are the essential factors in the etiology of beri-beri, of sprue, of tropical ulcers? What are the principal harmful parasites in our new possessions? Why is it that malarial fevers prevail in the more elevated regions rather than in the vicinity of the paddy fields of valleys near the sea level? What is the principal habitat of *Amœba dysenteriae* outside of its human host?" He noted the important function of the medical officer in instructing the line upon the essentials in averting epidemics, referring *en passant* to the need for ample teaching in hygiene at West Point, and closed by showing the young officers that it was for them to sustain and perpetuate the high ideals as to duty and loyalty both to the country and to the medical corps of the army, which had been so worthily upheld by their predecessors, and assured them that they had just reason to be proud of the fact that they had been admitted to a *corps d'élite*, access to which could only be obtained through merit, — continuing in words so wisely stated that they should be held in memory

by every member of the corps: "You will find that officers of the line and of other staff corps are always ready to treat you with the consideration due you as officers of the army and members of a learned profession, unless in some way, by your own actions, you forfeit their esteem or good will. Let your conduct always be such that they will not only recognize and rely upon your professional skill, but will honor and confide in you as gentlemen '*sans peur et sans reproche*.' Be loyal to your superiors, and just to your inferiors, pains-taking and thorough in all you undertake, not over-exacting as to your rights and privileges, and never enter upon a controversy, personal or official, unless you are sure that you are right and that the subject is of sufficient importance to justify you in an effort to prove it. Never fail to respond to professional calls in the families of officers and enlisted men on the ground that they are not entitled to your services or that the ailments complained of are trivial; it is much better to make unnecessary visits than to gain the ill will of those who summon you believing your professional assistance is necessary. Do not seek personal advantages through irregular channels. The chief of your corps can best judge whether a particular assignment which you may desire would conflict with the interests of the service or the rights of others. If not, and in his judgment your request is reasonable, it will always give him pleasure to grant it. But an attempt to escape a duty or to secure an assignment through outside influences show an indifference to the best interests of the service and the rights of others and is evidence of disloyalty to the chief of the corps which can not fail to give him an unfavorable opinion of one who would resort to such methods. Finally, do not forget to apply practically the knowledge of hygiene which you have acquired for the preservation of your own health. Aside from any personal interest you may have in the matter, it is your duty to do so; for, if you contract a preventable disease through your own neglect of the proper measures of prophylaxis, or are prematurely retired from the service for Bright's disease, cirrhosis of the liver or some other

chronic ailment caused by excesses of any kind, you deprive the government of the services of a valuable trained officer."

A most interesting feature of the program was the awarding of the Hoff Memorial Gold Medal endowed by the President of this Association, Lieutenant Colonel John Van Rensselaer Hoff, in memory of his father, Surgeon A. H. Hoff in his day one of the most distinguished members of the army medical corps. The medal was conferred by the founder in person upon Lieutenant James M. Phalen, who had attained the highest average of scholarship during the course. Of this medal the *Army and Navy Register* in its issue of April 5 publishes a handsome engraving which we are permitted to use in the JOURNAL, and accompanies it with a fine view of the faculty and student officers and several interesting snapshots showing the actual work of the institution.

The diplomas were presented by the Secretary of War with a few well chosen words of congratulation upon the opportunity afforded the class of enjoying the two highest privileges in life,—to serve humanity and to serve one's country. He cordially recognized the value of the work of the army medical department and closed with a comment upon the difficulty of maintaining the present high standard of excellence. In concluding the exercises, the Commanding General of the Army paid a high tribute to the medical department which he regarded as the most popular branch of the service, in whose members professional acquirements were no less conspicuous than the courtesy and kindly spirit which had so endeared them to their comrades.

THE SANITARY SERVICE OF THE NORWEGIAN ARMY.

AHDSOMELEY printed brochure for which we are indebted to the courtesy of Lieutenant General Thaulow, Surgeon General of the Norwegian Army and Marine, gives an excellent account of the sanitary service of the army of that country.

The organization of the Norwegian army is based upon the principal of universal military service.

The sanitary service is organized along military lines whether for peace or war and is in every respect conformable to the other services of the army. The chief of the sanitary service is a General officer—since 1901, a Lieutenant General—and holds the same relation to his corps as other chiefs of staff departments.

The military surgeons are commissioned officers; and are of two kinds, those of the permanent establishment and those who are serving their time with the colors.

All medical students are assigned to the sanitary department when they come up for military service; it will thus be possible in case of war to bring into the field any number of trained military surgeons that may be necessary.

The non-commissioned officers, corporals and privates, are also of two categories. All young men assigned to the sanitary service are instructed and drilled, but the non-commissioned officers of the permanent establishment are given special instruction along more extended lines.

For *Bearers* are selected men strong in every particular. Their drills are of the same duration as those of young infantry soldiers.

The *Nurses* are taken from among men assigned to auxilliary service.

In the combatant branches of the army,—instructed by the personnel of the sanitary service attached to these branches,—are the *regimental bearers* who remain with their own organizations and are not detached for sanitary service until just before battle.

PERSONNEL OF THE SANITARY SERVICE.

The personnel of the sanitary service is divided between the combatant forces and the special forces of the sanitary service. The latter comprise:

COMPANIES OF THE SANITARY SERVICE.

1 Captain, commanding, mounted; 4 Lieutenants, of whom 2 are mounted; 1 Sub-Lieutenant (of transportation) mounted,

detached from the military transportation corps; 1 Sergeant major; 1 Q. M. Sergeant; 6 Bearer Sergeants; 2 Nurse Sergeants; 10 Bearer Corporals; 2 Nurse Corporals; 1 Sergeant of transportation, mounted; 1 Corporal of transportation, mounted; (these two detached from the transportation corps); 2 Trumpeters; 96 Bearers; 6 Nurses; and the following detached from the transportation corps; 1 Saddler; 1 Tailor, 1 Shoemaker; 4 Ordnance soldiers, 11 Pioneers.

FIELD HOSPITALS.

100 BEDS.

1 Captain, commanding, mounted; 2 Lieutenants; 1 Pharmacist; 1 Steward; 3 Nurse sergeants; 3 Nurse corporals; 6 Nurses; 2 Cooks; 1 Ordnance soldier and 6 Pioneers, detached from the transportation corps.

STATIONS, (ÉTAPES).

1 Major commanding; 1 Lieutenant, aide-de-camp.

Together with: 6 Captains; 10 Lieutenants; 1 Sub-Lieutenant, detached from the transportation corps; 1 Administration clerk; 2 Stewards; 2 Pharmacists, 1st class; 2 Pharmacists, 2d class; 1 Surgical Instrument Maker; 20 Sergeants; 24 Corporals; 60 Nurses; 8 Cooks,—distributed among the various stations and railway transports of each station.



Four-wheeled Surgical Wagon.
ons of the service,—the line, the *landvern* and the *landstorm*.

The organization is the same for all three divisions of the service,—the line, the *landvern* and the *landstorm*.

EQUIPMENT.

Like the personnel, the equipment is divided between the sanitary troops and the combatant forces.

EACH COMPANY OF THE SANITARY SERVICE.

2 Surgical wagons; 2 baggage wagons; 6 ambulances, 2 horses. The ambulance contains 1 canvas covered compartment with 2 movable cushions for patients sitting, and 8 litters, of which the canvas, slings, etc., are placed in the am-



Four-wheeled Ambulance.

bulance while the poles are attached to the sides of the vehicle by a special mechanism.

The ambulance complete with accessories, exclusive of the litters, weighs about 500 kilos; it accommodates 4 patients lying and 1 seated, or 5—and in urgent cases—7 seated.

The supplies, comprising material for 50 beds and all that is needed for the establishment and conduct of a hospital, are carried in nine 2-horse vehicles; 2 surgical wagons, carrying medicines, surgical instruments, apparatus, dressings, etc.; 1

baggage wagon for the personnel of the hospital; 6 baggage wagons for the remainder of the supplies.

Total weight of each wagon, loaded, about 1020 kilos or total weight of the entire hospital, including the wagons, about 10,000 kilos.

In addition to the sanitary supplies attached to the staff and at the depots, the *combatant* forces are equipped as follows:

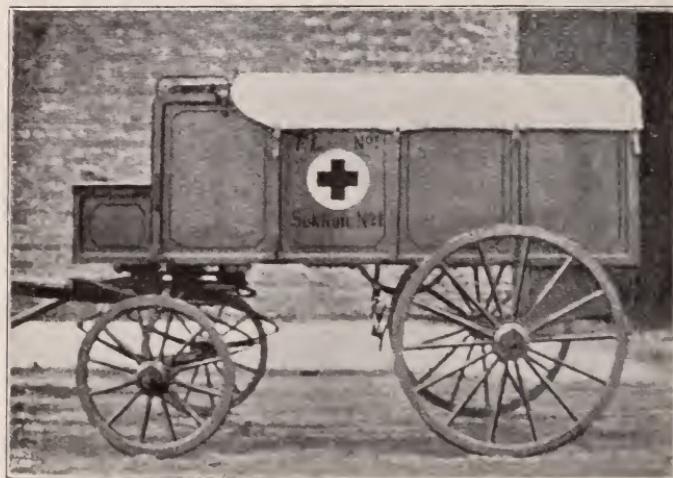
ENGINEERS.

For each company: 1 hospital pouch; 2 litters.

ARTILLERY.

LIGHT ARTILLERY.

For each battalion: 1 4-wheeled ambulance; 8 litters.



Hospital Baggage Wagon.

For each battery: 1 hospital pouch; 2 litters.

MOUNTAIN ARTILLERY.

For each battery: 1 hospital pouch; 2 litters.

COAST ARTILLERY.

For each company: 1 hospital pouch; 2 litters, plus the equipment of the sanitary service stationed at fortified places.

CAVALRY.

For each regiment: 1 4-wheeled ambulance; 8 litters.

For each squadron; 1 pair sanitary saddle-bags.

INFANTRY.

For each battalion (of about 800 men): 1 surgical wagon; 1 two-wheeled ambulance, drawn by a single horse, assisted if necessary by another horse tandem.

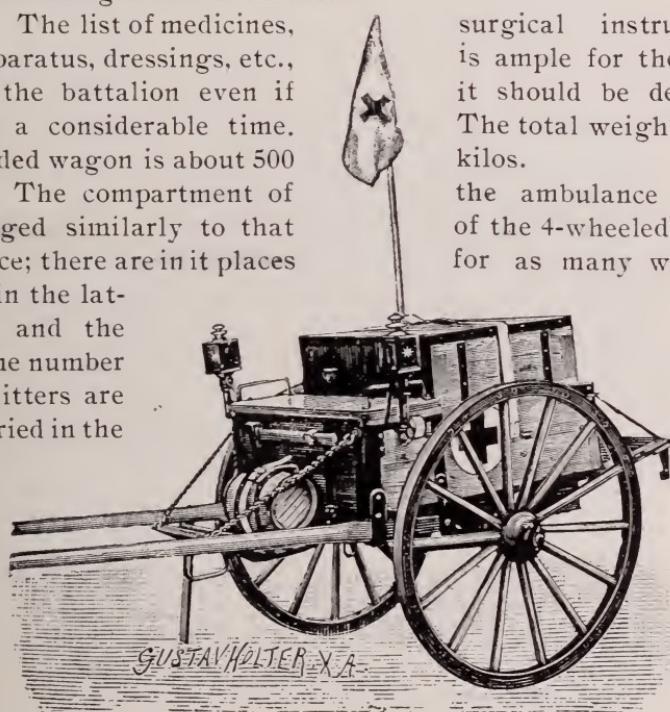
Each surgical wagon carries five cases containing all the supplies necessary for treating the sick of the battalion or for establishing a first aid station.

The list of medicines, apparatus, dressings, etc., of the battalion even if for a considerable time loaded wagon is about 500

The compartment of ranged similarly to that lance; there are in it places as in the latter and the same number of litters are carried in the

surgical instruments, is ample for the needs it should be detached. The total weight of the kilos.

the ambulance is ar-
of the 4-wheeled ambu-
for as many wounded



Two-wheeled Surgical Wagon.

same manner as has been described in connection with the 4-wheeled ambulance. The total weight of the 2-wheeled ambulance loaded (including the mattresses, etc., but without the litters) is about 320 kilos.

MILITARY TRANSPORTATION CORPS.

For each company: 1 hospital pouch; 2 litters.

THE LITTER.

The litter is separable and comprises canvas, end pieces and poles. The poles are of pine, young and straight, provided with brass sheathing; the end pieces are of plane wood and consist of two feet between which extends a plain cross-piece; along the upper borders there are brass buttons for



Two-wheeled Ambulance.

fastening the canvas. The canvas is strong and of a brown color, and has at one end a pillow case to be stuffed with hay, straw, etc.

Each part of the litter is so constructed as to be interchangeable with those of other litters, *i. e.* any two poles, two end pieces and a canvas will combine into a litter with equal accuracy and ease.

The litter is also "common," *i. e.* it goes equally well in

the wagons of the sanitary service or in the railway cars so as thereby to avoid the transfer of a patient from one litter to another.

The weight of the litter is 7.5 kilos; it is very solid and may be handled, mounted and dismounted with facility.

THE IMPROVISED SANITARY TRAIN

is furnished with suspension apparatus according to the French system, but a little more spacious so as to take in the litter which is somewhat larger than the French litter.

STORAGE ESTABLISHMENTS OF THE STATIONS OF THE SANITARY SERVICE.

The equipment of these establishments is based essentially upon the temporary hospitals and on the movement of the scene of hostilities.

PERSONAL EQUIPMENT.

For officers: 1 shoulder insignia; 1 dressing case.

For sub-officers: 1 shoulder insignia; 1 portable lantern; 1 knife.

For corporals: 1 dressing pouch; 1 small canteen; 1 portable lantern; 1 knife.

For privates: 1 knife.

The bearers are also equipped at the present time with a sword-bayonet, until it can be replaced by a short sword with a saw-tooth back.

Officers and sub-officers wear the sabre.

The personnel of the sanitary service is also armed with a revolver. The combatant soldiers do not carry a first dressing packet but dressings are to be had in great abundance from the dressing material and equipment of the personnel of the sanitary service.

THE BEAUMONT MEMORIAL AT FORT MACKINAC.

THE interest in original investigation so earnestly fostered in the army medical department of late years is not of recent date. Many military medical officers have struck out along new lines and brought new discoveries

to light. Conspicuous among these was Surgeon William Beaumont of the United States Army whose experiments upon the function of digestion conducted by means of a gastric fistula



The Beaumont Memorial at Fort Mackinac.

in the person of Alexis St. Martin, added greatly to the scientific knowledge of the third decade of the nineteenth century. His memory was honored by the attachment of his name to

the Beaumont Medical College in St. Louis, where he continued the practice of medicine after resigning from the army, and now the great series of experiments, by which he abundantly enriched human knowledge and immortalized his name, has been commemorated by the erection, upon the site of his experiments, of a massive trophy in enduring granite. The Beaumont memorial number of the *Physician and Surgeon*—to the Editor of which the JOURNAL is indebted for the illustration of the monument,—contains a symposium upon the life, career and work of Dr. Beaumont, which is of particular interest because of the picture it furnishes of the great investigator whom it commemorates. The monument bears the following inscription:

NEAR THIS SPOT
DOCTOR WILLIAM BEAUMONT
U. S. A.
MADE THOSE EXPERIMENTS UPON
ALEXIS ST. MARTIN
WHICH BROUGHT FAME TO HIMSELF
AND HONOR TO AMERICAN MEDICINE.

THE ASSOCIATION OF MEDICAL OFFICERS OF THE ARMY AND NAVY OF THE CONFEDERACY.

THOSE of our members who attended the St. Paul meeting will remember the pleasant interchange of courtesies, by telegraph, between our Association and that of the Medical Officers of the Confederacy in session on the same date at Memphis, Tenn. Col. John M. Keller, then President of that Association, joined ours in 1899 when Surgeon General of Arkansas. This year the Confederate Association met in Dallas, Texas, April 22-25, under the Presidency of Dr. D. D. Saunders of Memphis.

The *Southern Practitioner*, edited and published at Nashville, Tenn., by Dr. D. J. Roberts, is the organ of that association. From a recent article the interesting historical fact is noted that in January 1863 the first number of "*The Confederate States Medical and Surgical Journal*," a medico-mili-

tary monthly under the auspices of the Surgeon General appeared and was issued regularly ending with the number for February, 1865 when the war was about to close. The subscription price, at first \$10, was later advanced to \$20. A file preserved in the Library of the Surgeon General's Office at Washington shows that though issued under serious difficulties, it was an able and most useful journal. It also appears that in August, 1863 at Richmond, Va., "The Association of Army and Navy Surgeons of the Confederate States" was organized under the presidency of Dr. S. P. Moore, formerly of the U. S. Army and then Surgeon General of the Confederate Army.

The present "Association of Medical Officers of the Army and Navy of the Confederacy," largely historical in character, was organized in 1874.

All ex-medical Officers of the Confederate Army and Navy are now under the amended constitution, eligible to membership in our Association and will be cordially welcomed.

A MAJOR-GENERALCY FOR SURGEON GENERAL STERNBERG.

THE sentiment of the Association of Military Surgeons has long been strongly disposed toward the advancement of the surgeon-generalcy of the army to a grade commensurate with the authority and responsibility incumbent upon the office. In none of the great powers does the senior military medical officer rank so low as in the United States. In Great Britain and in Norway, the surgeon general has the rank of Lieutenant General, while in our own navy the surgeon general may attain the rank of senior Rear Admiral—equivalent to Major General—as did the distinguished predecessor of the present accomplished surgeon general of that service. The duties incumbent upon the surgeon general of the army, the responsibilities inherent in his office, and the actual command exercised by him in the medical and hospital corps are materially more extensive than those exercised by a briga-

dier-general of the line and exceeded by few major-generals.

During the Spanish war and the consequent Philippine operations, the work of the Surgeon General increased by leaps and bounds. New problems of vital importance arose in rapid succession only to be solved with prompt judgement and uniform success. Original work of great proportions was demanded of the office and the demand was unhesitatingly met. With a high ideal of scientific acquirements the Surgeon General fostered in his corps an activity along professional lines which has achieved results of incalculable value to humanity. The practical and potentially entire extirpation of yellow fever is but one of many scientific and humanitarian acts rendered possible by his devotion to duty in its broadest and highest sense. With executive capacity of the soundest type his administration of the enormous business affairs of his office has been characterized by exceptional sagacity and skill, while the military phases of his command have continued to progress with cumulative advantage to the service. General Sternberg's incumbency of the surgeon-generalcy indeed has been continuously marked by lofty aims and results so beneficial to the army and to the country that his promotion to the grade of major general prior to his retirement for age would be but a slight recognition of his worth.

RESOLUTIONS BY THE ARMY MEDICAL LYCEUM OF
MANILA CONCERNING THE LATE COLONEL
BENJAMIN FRANKLIN POPE, U.S.A.

THE Army Medical Lyceum announces with profound sorrow and regret the death of its distinguished President, and promoter, Colonel Benjamin F. Pope, Assistant Surgeon General, U. S. Army, Chief Surgeon, Division of the Philippines.

Colonel Pope was always a courteous gentleman and an efficient medical officer in its broadest sense, and as such enjoyed the distinction of a long and honorable career in the public service of his country, to which he devoted the best ef-

forts of his life, ever mindful of his trusts, cheerful in his demeanor, kind and considerate to his subordinates, and ever diligent in the performance of his duties. Death sought and claimed him in the midst of his labors at the very forefront of duty.

RESOLVED, that the Medical Officers of the Division and Army Medical Lyceum can pay no greater tribute to the memory of their departed Chief and comrade than to state that so long as integrity, honor and noble manhood are to be admired, so long will his name remain treasured in the hearts of those who knew him best.

FURTHER RESOLVED, that the expression of this sentiment be inscribed upon the records of the Army Medical Lyceum, and copies transmitted to the bereaved family and the JOURNAL OF THE ASSOCIATION OF MILITARY SURGEONS OF THE UNITED STATES.

Committee: L. M. MAUS,

Lieut. Col., Deputy Surgeon General, U.S. Army.

 L. W. BRECHEMIN,

Major, Surgeon, U.S. Army.

 J. M. KENNEDY,

Major Surgeon, U.S. Vols.,

 ROBERT T. OLIVER,

Examining and Supervising Dental Surgeon, U.S.A.

Manila, Philippine Islands, February 27, 1902.

A RARE AND EARLY BOOK ON THE WORK OF THE
MEDICAL DEPARTMENT OF THE NAVY.*

THIS volume, a small octavo, was met with too late for inclusion in the scanty and hastily collected list of works of naval medical authors—which no doubt is still very incomplete,—in my brief sketch of the naval medical corps. The work of Cutbush antedates that of

**Observations on the Means of Preserving the Health of Soldiers and Sailors, and on the Duties of the Medical Department of the Army and Navy, with remarks on Hospitals and their internal arrangement.* By EDWARD CUTBUSH, M. D., of the Navy of the United States, Philadelphia, 1808.

Barton by several years. Its author was appointed a surgeon in the Navy in 1799 and appears to have resigned in 1829. We learn from his preface that he was "attached to the militia of Pennsylvania in 1794, first as hospital surgeon, then as surgeon-general." The book is simply and modestly written, professedly a *résumé* from French and English sources reinforced by personal experience, and eminently practical,—e.g. considerable space is devoted to recipes for various foods for the sick, especially those prepared impromptu from scanty materials. Even under present conditions, there is much that is of interest and applicable to the camp and the ship.

GEORGE PERLEY BRADLEY.

THE "AMES BOARD"—A CORRECTION.

THE modified litter described on another page of this volume* under the name of "the Mahan Board," the author wishes to state, was designed by Surgeon Howard E. Ames, U.S.N., who made the first one on the U.S.S. Montgomery in 1893, since which time he has continuously employed the board method of handling the disabled. In view of this fact, Passed Assistant Surgeon Carpenter would change the name given this apparatus in his article to "the Ames Board," by which he refers to it in his latest paper on "The Duties of the Medical Department at 'General Quarters'."

COPIES OF THE THIRD VOLUME OF THE PROCEEDINGS OF THE ASSOCIATION WANTED.

THE supply of the third volume of the Proceedings of the Association in the custody of the Treasurer having been exhausted, members or others having copies of that volume, of which they are willing to dispose, are requested to notify the Editor of the Journal.

**Journal of the Association of Military Surgeons of the United States*, vol. x, p. 432.

Reviews of Books.

SURGICAL EXPERIENCES IN SOUTH AFRICA*

THIS is one of the most valuable contributions to military surgery that we have seen. The modesty of its title is only surpassed by the value of its contents, for it is a carefully collated and intelligently executed work on Military Surgery and its character would have been much better indicated to the student had it been called: Military Surgery as Illustrated by Observations in South Africa, 1899-1900. The text is divided into twelve chapters treating respectively of (1) Introductory matters, including transportation; (2) Modern Military Rifles and their Action; (3) General Characters of Wounds inflicted by Bullets of Small Calibre; (4) Injuries to the Bloodvessels; (5) Injuries to the Bones of the Limbs; (6) Injuries to the Joints; (7) Injuries to the Head and Neck; (8) Injuries to the Vertebral Column and Spinal Cord; (9) Injuries to the Peripheral Nerves; (10) Injuries to the Chest; (11) Injuries to the Abdomen; and (12) On Shell Wounds. It is beautifully illustrated with a hundred and twenty one engravings, twenty-five of which are full page plates and ninety-six intercalated in the text, all constituting probably the most extensive and instructive series of engravings illustrative of gunshot wounds ever given to the profession in a single collection.

He notes the fact that the introduction of small calibre bullets has robbed wounds of the joints of much of the importance they possessed in earlier days and that during the South

**Surgical Experiences in South Africa, 1899-1900*; being mainly a clinical study of the nature and effects of injuries produced by bullets of small calibre. By GEORGE HENRY MAKINS, F. R. C. S., late one of the Consulting Surgeons to the South African Field Force. 8vo, pp. xvi, 489. 121 illustrations. London, Smith Elder & Co., 1901.

African campaign they were little more to be dreaded than uncomplicated wounds of the soft parts alone; no more striking evidence, he remarks, of the aseptic nature of the wounds and the harmless character of the projectile as a possible infecting agent, than that offered by the general course of these injuries, is to be found in the whole range of military surgery. Not less important than the localized character of the bone lesion itself is the fact that the accompanying wounds of the soft parts retain the small or type forms. Thus he occasionally observed more troublesome results from minor shell wounds in the neighborhood of joints but not implicating the synovial cavity than in actual perforating injuries produced by bullets of small calibre.

With regard to wounds of the abdomen he remarks that perhaps no chapter of military surgery was looked forward to with more eager interest than that dealing with the treatment of these injuries; in none was greater expectation indulged in with regard to probable advance in active surgical treatment and in none did greater disappointment lie in store. Wounds of the solid viscera it is true proved to be of minor importance when produced by bullets of small calibre; but wounds of the intestinal tract, although they showed themselves capable of spontaneous recovery in a certain proportion of the cases observed, afforded but slight opportunity for surgical skill, and results generally deviated but slightly from those of past experience. Such success as was met with depended rather on the mechanical genesis and nature of the wounds than upon the efforts of the surgeon, and operative surgery scored but few successes. The difficulties of operating under absence of modern operative refinements scarcely alone accounted for the want of success attending the active treatment of wounds of the intestines when occasion demanded. Failure was rather to be referred to the severity of the local injury to be dealt with or to the operations being necessarily undertaken at too late a date. Many fatalities again, were due to the association of other injuries, a large proportion of the wound tracks involving other organs and parts beyond the boundaries of the additional cavity. Such favorable re-

sults as occurred in abdominal injuries were practically limited to wounds caused by bullets of small calibre and, while a few cases are on record of recoveries from visceral shell wounds, the author never met with a penetrating visceral injury from a Martini-Henry or large sporting bullet which did not prove fatal.

He considers the primary field dressing of importance and describes the first field dressing of Cheatle consisting of (1) a paste contained in a collapsible tube and made up in the following proportions: mercury and zinc cyanide grs. 400, tragaganth in powder gr. 1, carbolic acid grs. 40, sterilized water grs. 800; (2) sufficient bicianide gauze and wool for the dressing of two wounds; (3) a bandage and four safety pins; (4) the whole enclosed in a mackintosh bag. The paste possesses the advantage over any liquid or powder, that it can be applied in any position of the body to severe wounds and its application in the open air is not interfered with by draughts of wind.

Upon arrival at the field hospital the wounds were commonly re-dressed, after cleansing with a solution of perchloride of mercury or of carbolic acid, with a dressing of double cyanide of mercury and zinc, covered by a pad of wool and secured with a bandage. He thinks the bicianide gauze, absorbent wool and common open-wove bandages together with a good supply of nail brushes, soap and carbolic acid for the primary disinfection of the skin and the external wound, are not to be greatly bettered at the present day as materials for the first permanent dressing of cases in the field. The one desirable improvement is some mode of ensuring the dressing being kept in good position, and for this some form of adhesive covering for the gauze and wool should be devised. The first dressing in the field hospital, he impressively urges, seals the fate of the wound as to the chances of primary union, and hence too much care is impossible with it.

Many other features of the book are worthy of quotation, for its value and interest becomes increasingly evident upon closer inspection. but they must be examined in the work itself which may well be in the hands of every military surgeon,

JAMES EVELYN PILCHER.

MOSQUITO BRIGADES.*

I.

IN THIS little work, the well-known author confines himself closely to the subject indicated in the title. It is not a treatise on mosquitoes and mosquito-borne diseases, but simply a manual for conducting a successful campaign against the insect enemy. As stated in the preface, it is based upon the author's experience gained during many years' study of mosquitoes in various parts of the world and more especially upon the actual results of the operations now being carried on in West Africa by the Liverpool School of Tropical Medicine. It is not written only for medical men in the tropics, but for any one who lives in a country where mosquitoes abound.

First describing briefly the varieties of mosquitoes of pathogenic importance, their breeding places and the way to find and distinguish the insects and their larvæ, the author takes up the appointment of the Commandant or Superintendant of the Brigade and the organization of the force which he divides into the *Culex* and the *Anopheles* gangs. He then gives, in detail, the duties of these men in the destruction of larvæ and adult mosquitoes and especially the removal and prevention of all collections of standing water, in which only they can breed, and the apparatus and material needed. He touches but briefly on other measures for opposing the enemy, such as the use of screens, &c. The author's motto is, "No stagnant water," which, he thinks "will shortly become the first law of tropical sanitation,"

As immediate action is always important he advises that municipal aid should not be waited for, but that means for the first attacks be obtained from public spirited individuals, trusting that the success of the early efforts will arouse the interest of the whole community and thus secure governmental support.

**Mosquito Brigades and How to Organize Them*, By RONALD ROSS, F.R.C.S.&c., Major Indian Medical Service, retired; Lecturer at the Liverpool School of Tropical Medicine. 8vo, pp. 100, New York, Longmans, Green & Co. 1902.

The appendix, containing "a history of the war against mosquitoes" in various countries, is of great interest and value as showing the wonderful results that have already been accomplished in the diminution of disease by the destruction of these insects. The work in this direction in Sierra Leone and other British colonies in West Africa, under the auspices of the Liverpool School of Tropical Medicine, has been highly successful, as also in Hongkong and other points under British control in China. The brilliant victory won over Yellow Fever in Havana by the U. S. sanitary forces is duly chronicled and Dr. Doty's campaign against malaria in Staten Island referred to.

The measures advocated by Major Ross in this book will not be novel to those already engaged in like work in this country, but his instructions are so methodical, concise and lucid and so thoroughly cover the ground, that the work cannot fail to be of much service to any one, either professional or lay, who is about to take up the fight against mosquitoes.

C. H. ALDEN.

II.

DR. ROSS, who was the first to demonstrate the passage of the malarial parasite from the stomach of the infected mosquito into the salivary gland, and to whom medical science is indebted for the identification of the species of the malaria-bearing mosquito, has recently been in charge of an experimental campaign against mosquitoes in the reduction of malaria in West Africa, and speaks with authority on the subject of which he writes. As its title indicates, the purpose of the book is to show the most modern and efficient methods of waging war against mosquitoes.

The first section of the book is devoted to an enumeration and consideration of various facts in the life-history of mosquitoes, a knowledge of which may be applied to their destruction. Popular misconceptions with reference to these insects are corrected, and the character of the breeding places of *Culex* and *Anopheles* is described.

In the second section of the book advice is given with re-

gard to the raising of funds to prosecute the work, the organization and distribution of work of the Culex and Anopheles "gangs", and the destruction of larvae and adults. To the latter, however, he believes little attention need be paid if the breeding-places are properly attacked. Dr. Ross does not by any means regard the extermination of mosquitoes from any given locality as practicable, but he does believe that such great reduction may be accomplished in the number of these insects as to practically stamp out locally the diseases which they transmit. The proof of the truth of this idea has recently been furnished by the elimination of yellow fever from Havana by measures directed solely against the mosquito. In an appendix, Dr. Ross gives a summary of the results of the warfare against mosquitoes as carried on, among other places, at Staten Island and Havana. A note of sarcasm against popular ignorance, indifference and inertia runs through the several pages, and it is easy to see that the writer's patience has been sorely tried by the slowness with which British officialdom grasps and acts upon new ideas.

The book is well written in a popular style, is free from unnecessary material and diffuse generalities, and furnishes in compact form much information of which the municipal health officer, army surgeon, or in fact everyone living in a mosquito infected district should be possessed. E. L. MUNSON.

THE DIAGNOSTICS OF INTERNAL MEDICINE.*

THE need of a complete and reliable treatise on diagnosis has long been felt by the medical profession. The successful accomplishment of the work has demanded a type of mind, compounded of the analytic and synthetic, so rare that the vacancy has hitherto remained unfilled. The superb volume of Dr. Butler, however, has fully met the demand. The subject is discussed under two general heads, (1)

**The Diagnostics of Internal Medicine. A Clinical Treatise upon the Recognized Principles of Medical Diagnosis.* By GLENTWORTH REEVE BUTLER, A.M., M.D., 8 vo. pp. xxviii, 1059. 224 illustrations. New York, D. Appleton & Co., 1901.

the evidence of disease and (2) diagnosis, direct and differential, of individual affections. The former comprises (*a*) a brief consideration of the clinical anatomy and physiology of various organs and systems, with practical points of every day utility; (*b*) a description of the approved methods of examination bearing constantly in mind the fact that the basis of the art of diagnosis is a thorough knowledge of clinical methods; (*c*) a careful consideration of the many signs and symptoms encountered in the practice of internal medicine; (*d*) a statement of the diagnostic significance of each sign and symptom, —*i. e.* the disease or diseases, the presence of which is more or less strongly suggested by the finding of a given sign or symptom. The second part comprises (*e*) a systematic series of succinct descriptions of recognized diseases and their symptoms, with (*f*) special reference to the diagnosis, direct and differential, of each disease. The two parts are thus complementary, which the author illustrates by stating that, "if in Part I it is stated that the finding of a persistently rapid pulse may be explained by the presence of exophthalmic goitre; or of a dry tongue and an inordinate thirst, by diabetes, one can turn to Part II and compare his case with the symptom group of the disease in question. Conversely, when in part II a high-tension pulse is mentioned as a symptom of angina pectoris, or Kernig's sign of meningitis, a reference to Part I will discover the method of estimating high tension or of eliciting Kernig's sign."

Introductory to the treatise proper, the author furnishes a "Synopsis (or Schedule) of examinations, constituting an order of procedure, and a symptom-guide." This consists of three parts, (I) the History or Anamnesis, (II) the General Examination, and (III) the Special Examinations. In connection with each point mentioned in the schedule, the page of the book upon which it is discussed is stated,—the combination forming an *ensemble* of the highest advantage to the student and practitioner.

With his mastery of classification and condensation and his felicity in expression it has been possible for the author to

compress the adequate treatment of a vast range of subjects within the covers of a single volume. The more recent phases of professional study are as amply treated as are the older features. Hæmatology is fully considered and the agency of the mosquito in transmitting the plasmodium maliaræ well developed; the more recently demonstrated agency of the stegomyia fasciata in transmitting yellow fever will doubtless find its place in the next edition, the demonstration having been too recently made to permit of its introduction in the edition now under consideration. The participation of microorganisms in the development and clinical course of disease is excellently brought out. In fact nothing which might be of advantage in identification of the internal affections to which humanity is heir is omitted.

The illustrations demand particular mention. Not only profuse in amount and exceptionally interpretative of the text, they also possess an artistic quality as unusual in other medical works as it is commendable in this. The use of a thin but opaque paper has made it possible to compress the 1078 pages of which it is composed into the limits of a volume convenient to handle and easy to consult. JAMES EVELYN PILCHER.

PARK'S SURGERY.*

THE third edition of Park's Surgery, replacing the earlier editions in two volumes is almost an entire new book. The additions and changes are numerous and extensive and have been made necessary by the rapid advance in methods of operating and improved means of diagnosis, thus increasing the value of the volume as a text-book, and a work of reference.

Sixteen of the chapters are by the editor, presenting some of the most important parts of the work in his very lucid style. The chapters on surgical pathology are complete and those

**A Treatise on Surgery by American Authors* for students and Practitioners of Surgery and Medicine. Edited by ROSWELL PARL, A. M., M. D. Third Edition. Svo. pp. 1408. 756 illustrations. Philadelphia, Lea Brothers & Co., 1901.

on inflammation are treated from the modern view of bacteriology. A new chapter on the surgical pathology of the blood, with illustrations of the different corpuscles is added; the necessary information as to their value in different diseases and operations outlined.

The auto-infection of surgical patients receives due consideration as do the surgical fevers and septic infections. The chapter on shock and collapse is brief, yet it contains, in the few pages allotted to the subject, all that other works on surgery contain and much more clearly stated. The author seems radical in his views of amputation of tuberculous extremities, whether he is justified is a question for the reader to decide.

The chapter on gunshot wounds by Major Nancrede, is brought up to date and includes reports and cases from the Cuban and South African wars. The effect of the modern bullet on the different tissues is fully described. Asepsis at the time of the first examination and dressing is rigidly insisted upon. The treatment of wounds of the different regions is noted and commented upon generally and attention called to the treatment of special wounds. Immediate operation is urged in penetrating wounds of the abdomen in civil practice, and attention called to the great mortality of immediate operation in military surgery. The treatment in full of these wounds is given under the appropriate heading in regional surgery.

In chapter XXVI written by the editor, he gives his views on the parasite origin of malignant tumors, as well as those of Cohnheim. The whole subject is treated in a dispassionate and temperate manner. An unique feature of the book is, under the heading of injuries and diseases of the lymphatic vessels a series of diagrams of the entire lymphatic system, showing the regions drained into each group of nodes. The deeper structures showing in red and the superficial in black. The revision of the chapters on fractures and dislocations is by the editor and is as complete on fracture as one could desire in a general work of the character. The chapter on dislocation is brief, but contains all that is necessary, except for the student.

Part VI. is devoted to special or regional surgery. This

to the general operator is the most important part of the work. The space devoted to diseases of the eye and ear might well have been left to the special works on these subjects as they are somewhat sketchy and generally unsatisfactory for reference. The chapter on abdominal surgery by Richardson, while enumerating the different methods of intestinal anastomosis, might well have included Maunsell's method of enterorrhaphy; it is easy, simple, and if not safer, at least as safe and as quickly done as any of the methods named. The chapter on hernia is clear and lucid, well illustrated and leaves nothing to be desired. The chapter devoted to amputations gives the latest and best methods of operating, the illustrations showing the most desirable lines for incision.

The editor and his able corps of authors have produced a work that has ranked as a standard in the past and with this revision, have so increased its value that it will be hard to surpass their present effort. As a specimen of bookmaking it reflects great credit on the publishers. A. R. ALLEN.

INJURIES OF THE BRAIN AND ITS MEMBRANES.*

ALTHOUGH of the greatest practical importance, the division of cerebral surgery comprising the injuries which the brain suffers from external violence, has received the least careful attention. This deficiency, Dr. Phelps undertakes to supply in the handsome work before us. He believes that a concise and systematic exposition of these injuries will not only be of interest to surgeons, but that it will meet the requirements of general practitioners in whose experience such injuries are infrequent, and who in exceptional instances have urgent need of the aid to be derived from a wider clinical observation than their own opportunities have permitted. The work is based essentially if not exclusively upon observations of five hundred consecutive cases of recent occurrence,—three hundred of which are quoted in condensed

**Injuries of the Brain and its Membranes from External Violence, with a Special Study of Pistol-Shot Wounds of the Head in their Medico-Legal and Surgical Relations.* By CHARLES PHELPS, M.D. Second Edition. 8vo. pp. xiv, 602. 49 illustrations. New York, D. Appleton & Co., 1900.

form at the conclusion of the book,—and a large number of necropsies and cadaveric experiments. Preceded by a succinct but comprehensive preliminary consideration of cranial fracture, he discusses the subject in its general aspect in six chapters, one devoted to pathology, two to symptomatology, one each to diagnosis and prognosis, and one to the principles of treatment. A second part of the work is occupied with pistol-shot wounds of the head which are first considered in their medico-legal relations and then in their surgical relations. The third portion of the book is concerned with reports of cases, two hundred and twenty-five of which were fatal and verified by necropsy and seventy-five of which culminated in recovery in which of course necropsy was impossible. In pistol-shot wounds, the author believes that the bullet, left by necessity or choice within the cranial cavity is usually septic, and necrotic changes ensue with constitutional infection; in the comparatively small number of cases, where it is aseptic, it may become encysted when it may be harmless or more probably the source of dural or cerebral irritation at a perhaps distant period. The ultimate result of a critical analysis of all available records, is that the cause of death in intracranial pistol-shot wounds has ordinarily been the same, whether or not operative interference has been made; and that the percentage of recovery has been greater when operation has been performed. If allowance were made for the number of cases in which sepsis was declared prior to operation, or in which other antecedent conditions made interference practically hopeless, the statistical advantage of operation would become very decided.

TYSON'S PRACTICE.*

THE single volume treatise has a most important position in the armamentarium of student and practitioner alike. The comprehensive system and the exhaustive cyclopedia stand in dignified seclusion upon the library

**The Practice of Medicine.* A Textbook for Practitioners and Students with special reference to Diagnosis and Treatment. By JAMES TYSON, M.D. Second Edition. Imp. 8vo p.p. 1222. 124 illustrations. Philadelphia, P. Blakiston's Son & Co., 1901.

shelves as courts of appeal when the entire body of knowledge upon a given subject is desired. But the single volume is the key with which the student is enabled to unlock the storehouse of medical information and by which, on the other hand, the practitioner is enabled constantly and with little exertion to keep before him the main lines of professional thought and scientific conclusion,—an instrument always at hand and ever ready for application.

In its adaptation to this important function Professor Tyson's work takes a high place. The scientific facts, as would be expected from a writer of the author's wide experience and high scholarship, are accurate and up to date. The text, formed and elaborated by many years of successful teaching, is clear, direct, concise and comprehensive. Tropical diseases, an acquaintance with which the recent extension of our national interests has rendered of vital importance to many practitioners, are not conspicuously present although many of them are well brought out. The mosquito origin of yellow fever is fully discussed and the conveyance of infection by the *Culex* described, but the extirpation of the disease by the coal oil treatment of stagnant water breeding places of the intermediate insect host, which was so marvelously demonstrated by Major Gorgas in Havana, is not touched upon, owing doubtless to its recent employment. The author's use of both the metric and the English system of weights is an especially commendable move in the right direction, a feature of the work which will appeal with especial weight to the army medical officer who is officially required to use the decimal system in his work. The conversion tables at the end of the book are particularly serviceable in connection with this fact.

THE PERPETUATION OF GRAY.*

GENERATION after generation of medical infants continue to be nourished upon the anatomy of Gray and none of the innumerable rivals for the favor of student or practitioner seem to have been able to interfere

**Anatomy, Descriptive and Surgical*. By HENRY GRAY, F. R. S. Revised American from the 15th English Edition. Imp. 8vo. pp. 1257. 780 illustrations. Philadelphia, Lea Brothers & Co., 1901.

with its perennial absorption. The original book was surpassingly adapted to the wants of the profession not only because of the clear statements and logical arrangement of the author but equally if not more because of the wonderfully instructive work of the illustrator. So much indeed of the credit for the utility of the book lies at the door of Mr. Carter who drew the original plates, that it is to be regretted that his name has been dropped from the title page. To keep abreast of the progress of the science it has been necessary, from edition to edition, to introduce new plates from other hands which only go to emphasize the superiority of the drawings of Mr. Carter. Nevertheless the new engravings, of which 231 have been added in the present edition have vastly increased the value of the book. Indeed a careful scrutiny reveals evidences in every part of the work of detailed revision, which has brought the text into full harmony with the most recent knowledge of the subject. Cerebro-spinal anatomy, as would be expected, presents evidence of the greatest amount of correction but no division of the subject has escaped the scholarly attention of the revisers.

THE STANDARD MEDICAL DIRECTORY.*

THERE is much that is attractive in this handsome volume. The shape appeals to one who has occasion to consult such a directory frequently,—the large pages, affording room for four hundred names on each, render the location of the individuals a matter of but little difficulty. When it shall have been further improved by the addition of an index, which the publishers promise for the next edition, it will most excellently fulfill its function.

**The Standard Medical Directory of North America, 1902; including a Directory of Practicing Physicians in the United States of America, Canada, Cuba, Mexico, and Central America.* 4to, pp. 909, Chicago, G. P. Englehard & Co., 1902.

The Eleventh Annual Meeting.

Washington D. C., June 5, 6, and 7, 1902.

GENERAL ARRANGEMENTS FOR THE ELEVENTH ANNUAL MEETING.

THE Eleventh Annual Meeting of the Association of Military Surgeons of the United States will convene in Washington, D. C., on Thursday morning, June 5, 1902, and continue in session during the two following days. Every member is cordially urged to be present and participate in all the exercises, both social and literary.

The preparations for the meeting are in charge of an active committee composed as follows:

COMMITTEE OF ARRANGEMENTS.

Major George Henderson, N.G.D.C., *Chairman.*

Major William C. Borden, U.S.A., *Treasurer.*

Major Frederick P. Reynolds, U.S.V., *Secretary.*

Lieutenant Charles R. Luce, N.G.D.C., *Assistant Secretary.*

Major Louis A. LaGarde, U.S.A.

Medical Inspector (Comdr.) Samuel H. Dickson, U.S.N.

Surgeon Louis L. Williams, U.S.M.H.S.

Dr. George M. Kober, Georgetown University.

Captain Edward L. Munson, U.S.A.

Dr. J. Ford Thompson, Columbian University.

Dr. Wallace Neff.

Dr. Henry Alfred Robinson.

CHAIRMEN OF SUB-COMMITTEES.

Speakers—Surgeon-General George M. Sternberg, U.S.A.

Receptions—Medical Inspector S. H. Dickson, U.S.N.

Entertainments—Major Louis A. LaGarde, U.S. A.

Finance—General George H. Harries, N.G.D.C.

Press and Printing—Captain C. Fred. Cook, N.G.D.C.

Hotels—Captain C. A. Weaver, N.G.D.C.

Badges—Major James E. Bell, N.G.D.C.

Music—Captain F. J. Woodman, N.G.D.C.

Registration—Lieutenant H. B. Hollifield, N.G.D.C.

Transportation—Lieutenant B. G. Pool, N.G.D.C.

Information—Lieutenant R. A. Foster, N.G.D.C.

Halls—Lieutenant W. D. Fales, N.G.D.C.

SOCIAL HEADQUARTERS.

The social headquarters will be at the New Willard Hotel, corner 14th Street and Pennsylvania Avenue, N. W. The evenings will be given up to pleasure, which will be amply and generously provided for by the Committee of Arrangements. *It is much desired by the committee that the members of the Association be accompanied by ladies, as special arrangements will be made for their entertainment by the Ladies' Auxiliary Committee.*

PLACES AND HOURS OF MEETING.

The first session of the meeting will be held in the National Theater, June 5, at 10 o'clock, a. m. The President of the United States is expected to attend this session.

All subsequent sessions will be held in the convention hall of the New Willard Hotel at 9 a.m. and 2 p.m. daily.

EXHIBIT OF MEDICO MILITARY MATERIALS.

There will be an exhibit of Surgical Instruments and Dressings and all lines pertaining to Military Surgery and Medicine. Many of the leading houses of the United States will be represented at this exhibit.

TRANSPORTATION.

Reduced railroad rates may be obtained by persons coming to this meeting at the rate of one fare and a third for the round trip. To assure the rate, each person must purchase, not earlier than three days before the meeting, one first-class ticket to Washington, D. C., and obtain from the ticket agent a certificate to that effect. *The certificate is absolutely essential*, as the reduced rate of one-third the regular return fare will be allowed only upon the presentation of the certificate, properly endorsed, to the ticket agent in Washington.

The return fare certificate should be deposited with the Committee of Arrangements immediately upon arrival in Washington.

The Big Four Railroad System from St. Louis or Chicago to Cincinnati in connection with the Chesapeake & Ohio Railway from Cincinnati to Washington is one of the most desirable routes from the West to the

National Capital. Arrangements have been made with these lines for special sleepers through to Washington, if the number of people warrant, leaving points named on *Tuesday, June 3d*, as follows:

St. Louis	- - - - -	12.00 noon.
Chicago	- - - - -	1.00 p. m.
Cincinnati	- - - - -	9.10 p. m.

—arriving in Washington 3.39 p. m, *Wednesday, June 4th*.

Delegates intending to come via Cincinnati will notify D. E. Holmes, City Passenger Agent C. & O. Railway, 5th and Walnut Streets, Cincinnati; those coming via Chicago, J. C. Tucker, General Northern Agent Big Four Railway, 234 Clark Street, Chicago; and those coming via St. Louis, C. L. Hillerry, Assistant General Passenger Agent Big Four Railway, St. Louis. These officers will reserve accommodations. As soon as you decide please notify the above named officials, so as to insure special sleepers.

HOTELS.

Among the hotels at which special facilities will be afforded the Members of the Association may be mentioned the following:

The New Willard, *Social Headquarters*, (European) \$2 to \$10 per day.

The Ebbitt House, *across 14th Street from the New*

Willard, (American),	- - - - -	\$2.50 per day
The rates given by both these hotels are much reduced.		

Hotel Raleigh, (European) - - - - - \$1.50 to \$4.00 per day.

The Riggs, (American) - - - - - \$3.00 to \$5.00 per day.

Hotel Johnson, (American) - - - - - \$1.00 to \$2.00 per day.

The Regent (European) - - - - - \$1 and upward per day.

There will be a detail of non-commissioned officers in uniform at the depots on June 4th and 5th to give members and visitors such information and assistance as they may desire. Members will please notify Capt. C. A. Weaver, No. 1614 Q Street, N. W., Chairman of Hotel Committee, of the date of their expected arrival, also the number in their party.

It is the desire of the Committee of Arrangements to make this meeting one of rare excellence and enjoyment to the participants. They trust that there will be a large attendance. The delightful season of the year to see Beautiful Washington, the special railroad fares and the much reduced hotel rates, in addition to the magnificent literary program, are but few of the many notably attractive features of the 1902 meeting.

GEORGE HENDERSON,

Chairman of the Committee of Arrangements.

PRELIMINARY LITERARY PROGRAM FOR THE ELEVENTH ANNUAL MEETING.

THE Literary Exercises at the coming meeting are already so far arranged that the main features can be announced. The Committee has received notice of fifty-six papers that will be presented on that occasion and several more important ones are known to be in preparation. The President of the Association informs the Committee that literary contributions will be made from Austria, Sweden and perhaps Germany.

Contributions will be grouped under several headings, each embracing papers on allied subjects. Under the first, "The National and State Medical Services," will be entered:

"The most practical organization for the Medical Department of the U.S. Army in active service," by the successful competitor for the Enno Sander Prize.

This essay, it is expected, will be made the basis of the principal discussion. Under the same heading will follow papers, on

"The Education of Medical Officers for the Public Service," by Med. Dir. J. C. Wise, U.S.N.

"The Qualifications and Selection of Medical Officers," by Lieut. Col. Chas. Adams, Ill. N. G.

"Character Study in the Examination of Persons for the Military Service," by Med. Dir. F. B. Stevenson, U. S. N.

"The Recruit," by Lieut. S. C. Stanton, Ill. N. G.

"Valor as an Incident of Medico-Military Service" by Major J. E. Pilcher, U.S.V.

"The Ohio Volunteers in the War with Spain," by Lieut. Col. H. M. W. Moore, Ohio N. G.

"The relations between Volunteer Aid Societies and the Public Medical Services," by Major George G. Groff, U.S.V.

Under the second heading, "Hygiene and Sanitation" there will be

Paper by Major W. C. Gorgas, U. S. A., Chief Sanitary Officer of Havana.

Paper by Lieut. Col. L. M. Maus, U.S.A. Commissioner of Health of the Philippines.

"The Prophylaxis of Certain Diseases incident to Camps in time of War," by Passed Asst. Surg. H. D. Geddings, U.S.M.H.S.

"Preventable Diseases in the Army" by Prof. G. M. Kober, late U.S.A.

"Practical Notes on Clinical Therapeutics in the Treatment of Venereal Manifestations among Soldiers of the Garrison of Vera Cruz," by Col. Z. R. Molina, Delegate from the Mexican Army.

"The Management of Small Pox", by Passed Asst. Surg. C. P. Wertenbaker, U.S.M.H.S.

"The Vaccination of Puerto Rico; a lesson to the World," by Major Azel Ames, U.S.V.

"Typhoid and Malarial Fevers at Chickamauga," by Major E. C. Carter, U.S.A.

"Anti-Typhoid Inoculations," by Dr. E. H. Wilson, Director in the Hoagland Laboratory, Brooklyn.

"The Army Cartridge Belt," by Major L. L. Seaman, U.S.Vol. Engs.

"Quarantine and its Relations to Military Operations," by Surgeon A. H. Glennan, U.S.M.H.S.

The third heading "Tropical Service and Tropical Diseases" will include papers on

"Some Practical Suggestions on Tropical Hygiene," by Major H. P. Birmingham. U.S.A.

"Tuberculosis in the Tropics" by Capt. J. J. Curry, U. S. V.

"Typhoid Fever in the Tropics," by Dr. T. C. Biddle, Topeka, Kansas.

"The Treatment of Yellow Fever, past and present," by Dr. James Carroll, U.S.A. member of the Yellow Fever Commission.

"Yellow Fever on shipboard in the Navy," by Surg. F.W.F. Wieber, U.S.N.

"The Pathology of Dysentery of Tropical Origin," by Dr. Charles F. Craig, U.S.A. Pathologist Presidio General Hospital, San Francisco.

"Experiences in Guam," by Surg. Philip Leach, U.S.N.

"Remarks suggested by Three Years Service in Cuba," by Capt. J. H. Stone, U.S.A.

"The Medical Topography of Puerto Rico," by Capt. José Lugo-Viña, P. R Regt. U.S.A.

"The Kahuna or Witch Doctor of Hawaii," by Major B.D. Taylor, U.S.A.

"Military Surgery" will include papers on

"Gunshot Wounds of the Shoulder and Knee Joints," by Col. G. R. Fowler, N.G.N.Y.

"Practical Application of Radiography in Military Surgery at Field Hospitals," by Major William C. Borden, U.S.A.

"Some Experiences with Bolo Wounds," by Lieut. Jere B. Clayton, U.S.A.

"Note on Bolo Wounds," by Passed Asst. Surg. C. DeW. Brownell, U.S.N.

"Volvulus in its relation to Hernia," by Surg. G. T. Vaughan, U.S.M.H.S.

"A further consideration of the necessity for immediate celiotomy in penetrating gunshot wounds of the abdomen in war" by Capt. Chas. E. B. Flagg, U.S.A.

"Surgery at the New York Naval Hospital" by Surg. George Rothganger, U.S.N.

"Wounds of Nerves" by Capt. James P. Warbasse, N.G.N.Y.

"Remarks on the effects of the Luger and Colts automatic Pistols" by Major L. A. LaGarde, U.S.A.

"The Laws of Ballistics and Physics the true explanation of the Lodgement and Deflection of Modern Small Arm Projectiles, not the Ricochet Hypothesis," by Major C. B. Nancrede, U.S.V.

Under "Military Hospitals and Military Nursing" there will be papers on

"The U.S. Army Hospital and Sanitorium for Pulmonary Tuberculosis at Fort Bayard, N. M.," by Major D. M. Appel, U.S.A. Commanding.

"Hospitals and Charities in Cuba," by Major J. R. Kean, U.S.A., Supt. Dep. of Charities.

"The Medical Department of the U. S. Transport Service," by Major H. S. Kilbourne, U.S.A., Superintendent.

"The Japanese Red-Cross Society, and Red-Cross Nurses" by Col. N. Senn, Surgeon General of Ill.

"The Training of Hospital Corps Men" by Capt. F. A. Winter, U.S.A.

"The relation of Personnel to Bed Capacity in Military Hospitals," by Capt. J. S. Kulp, U.S.A.

Among the Unclassified Papers will be:

"Operation of the Medical Department at the battle of Antietam," by Col. W. H. Forwood, U.S.A.

"How can Medical Officers promote expert marksmanship in the Army, by Gen. J. Francis Calef, Surgeon General of Conn., ret'd.

"Traumatic Rupture of the Choroid" by Lieut. Edward Stieren, N.G. Pa.

"The treatment of Gonorrhea in the Navy" by Passed Asst. Surg. S. G. Evans, U.S.N.

"The Military Motor Ambulance," by 1st Lieut. Clyde S. Ford, U.S.A.

"The Medical and Surgical Equipment of a Regiment for a week's tour of duty" by Lieut. Col. J. K. Weaver, N.G.Pa.

"A New Device for a First Aid Packet" by Asst. Surg. J. C. Thompson, U.S.N.

"A New Medical and Surgical Case, a substitute for the Hosp. Corps Pouch" by Capt. F. W. Hendley, Ohio N.G.

"Some of the More Important Considerations Governing the Action of the Board recently appointed to Revise the Supply Table of the Medical Department of the U. S. Army," by Capt. Edward L. Munson, U.S.A.

"The Work of the U. S. Army Medical Department in Alaska," by Major R. G. Ebert, U.S.A., late Chief Surgeon of Alaska.

"The Work of the U. S. Army Medical Department in China," by Major Frank J. Ives, U.S.A., late Chief Surgeon.

In the final program, there will be given after each group of papers, the names of Members who have agreed to take part in the discussion. Abstracts of the articles to be read cannot, unfortunately, be furnished but the foregoing list will indicate the topics to be taken up.

It is earnestly requested that writers who have not yet sent the titles of their papers will do so at once. Those who find they are unable to attend the meeting, will please send their papers to the Secretary, Major James Evelyn Pilcher, Carlisle, Pennsylvania, so as to reach him not later than May 31st, 1902.

CHARLES H. ALDEN,
Chairman of the Literary Committee.

Vol. X, No. 4

August, 1901

JOURNAL
OF THE ASSOCIATION OF
MILITARY
SURGEONS
OF THE UNITED STATES.

James Evelyn Pilcher,
EDITOR.



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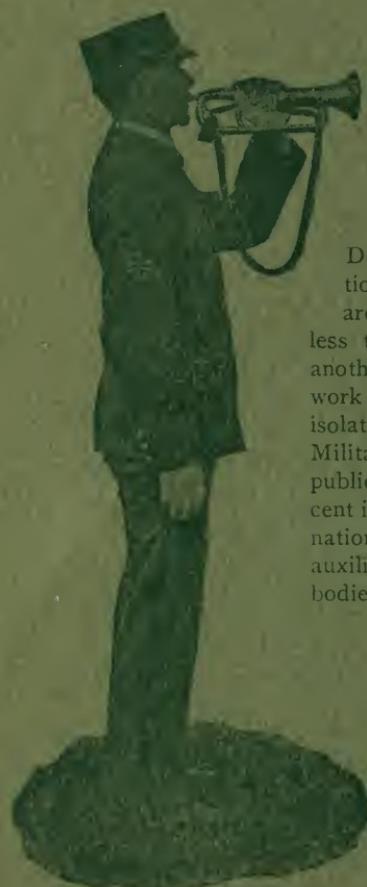
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1901.

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Association of Military Surgeons OF THE UNITED STATES.



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Periodical Publication.

In order to more efficiently accomplish this purpose, the Association has inaugurated a *Journal*, a copy of which is mailed free of cost to each member. This journal will publish not only the proceedings and all the papers of the annual meeting, but—

1. Will also present timely contributions upon military medicine and surgery in the intervals between meetings;
2. Will furnish in full or in abstract all important contributions in the field from current literature;
3. And, in its editorial department, will present all current news relating to the personnel of the organization.

It will thus keep every member of the Association continuously informed upon all phases of military medicine and surgery.

VOL. X, No. 2

November, 1901

JOURNAL
OF THE ASSOCIATION OF
MILITARY
SURGEONS
OF THE UNITED STATES.

James Evelyn Pilcher,
EDITOR.



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Every Medical Officer of the Army, Navy, Marine Hospital Service, and National Guard is eligible to membership, and the blank application on page xviii will enable those ready on the list of members to enter the Association, if filled out and mailed, with membership fee of Five Dollars to

MAJOR JAMES EVELYN PHICHER, Secretary, Carlisle, Penna.

Vol. X, No. 3

February, 1902

JOURNAL
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OF THE UNITED STATES.

James Evelyn Pilcher,
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Vol. X, No. 4

May, 1902

JOURNAL OF THE ASSOCIATION OF MILITARY SURGEONS OF THE UNITED STATES.

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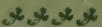


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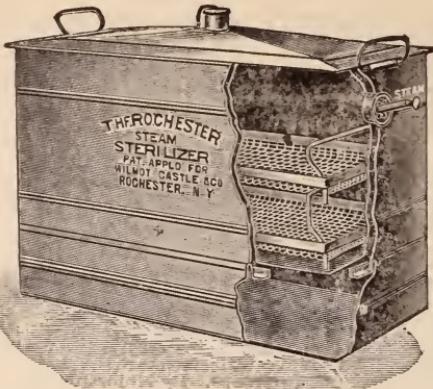
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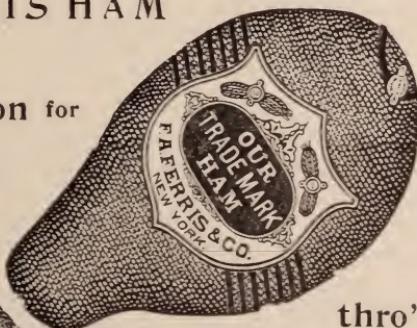
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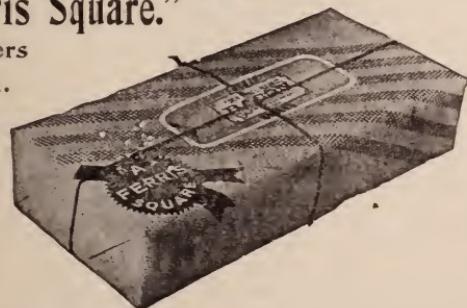
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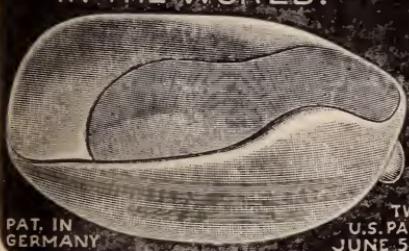
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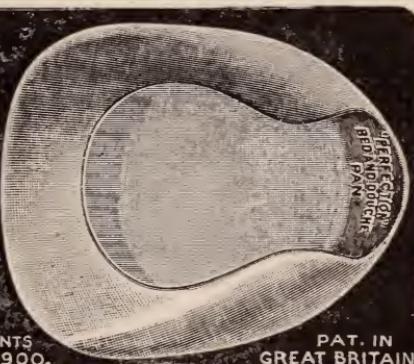
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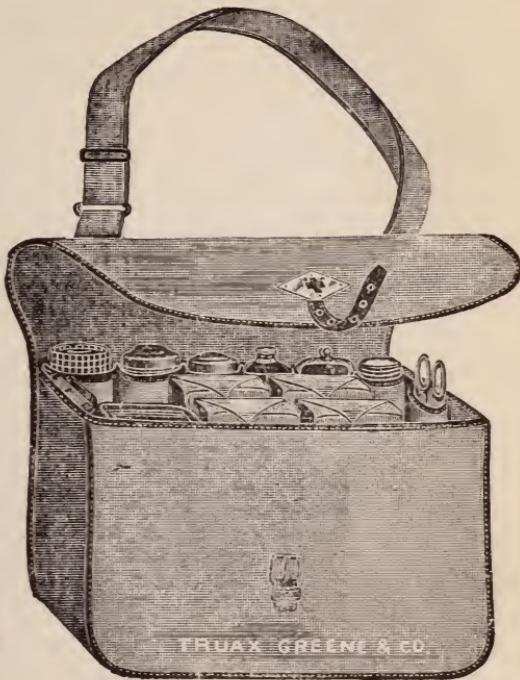
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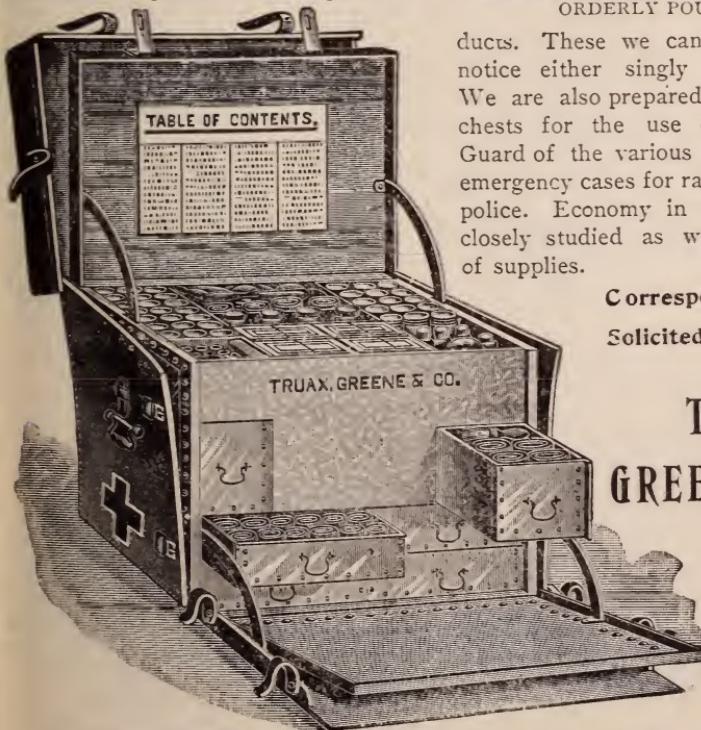
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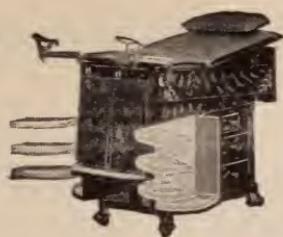


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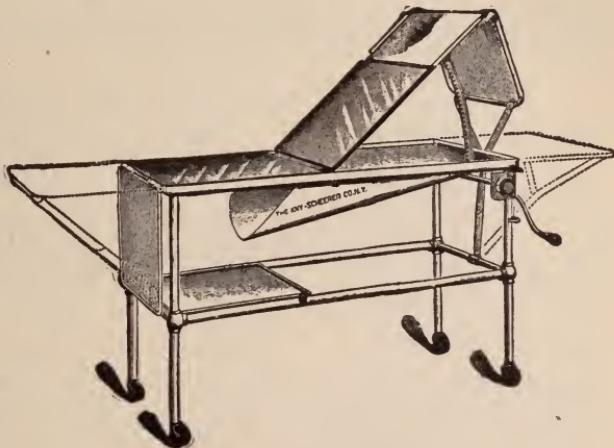
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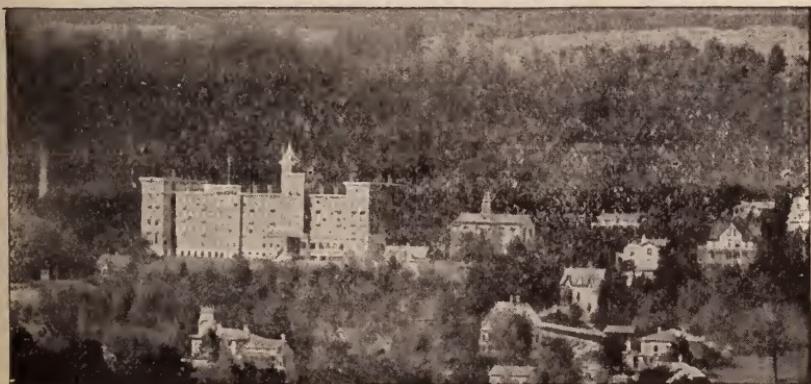
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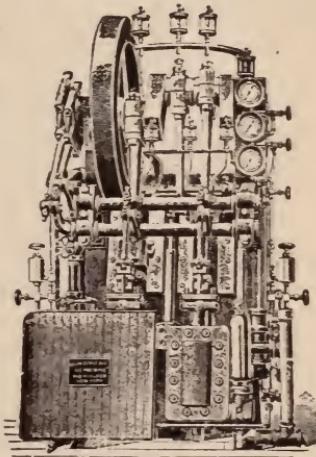
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VOLUME XI.



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Lieut. John B. McCook, Assistant Surgeon Conn. N.G.
Assistant Surgeon A. J. McLaughlin, U.S.M.H.S.
*Contract Surgeon Anita Newcombe McGee, U.S.A.
Lieut. Clarence J. Manly, Assistant Surgeon U.S.A.
Lieut. Col. Otis H. Marion, Medical Director M.V.M.
Medical Director Robert A. Marmion, U.S.N.
Acting Assistant Surgeon William H. Marsh, U.S.M.H.S.
Captain William M. Martin, Surgeon Kansas N.G.
Major Ralph W. Montelius, Surgeon N.G.Pa.
Hon. William H. Moody, Secretary of the Navy.
Brig. Gen. John Moore, Surgeon General Retired, U.S.A.
Captain Frederick H. Morhart, Assistant Surgeon U.S.V.
Lieut. Henry Morris, Assistant Surgeon N.G.Pa.
Captain Edward L. Munson, Assistant Surgeon U.S.A.
Lieut. Col. Charles F. W. Myers, Medical Director N.G.N.J.
Major Charles B. Nancrede,* Chief Surgeon U.S.V.
Major Wallace Neff, *Brigade Surgeon U.S.V.
Major M. A. Newell, Assistant Surgeon General of Wyoming.
Major James B. O'Neill, Surgeon Maine V.M.
Captain E. B. Osborne, Assistant Surgeon Texas V.G.
Lieut. J. Mark Peters, Assistant Surgeon, N.G. Pa.
Lieut. B. G. Pool, Surgeon D.C.M.
Colonel R. Harvey Reed, Surgeon General of Wyoming.
Major Walter Reed, Surgeon U.S.A.
Lieut. Col. Robert Reyburn, *Surgeon U.S.V.
Captain Frederick P. Reynolds, Assistant Surgeon U.S.A.
Contract Surgeon Josiah W. Richards, U.S.A.

*Not now in active service as such.

Rear Admiral Presley M. Rixey, Surgeon General U.S.N.
Major William H. Rodman, Surgeon N.G.Missouri.
Hon. Theodore Roosevelt, President of the United States.
Hon. Elihu Root, Secretary of War.
Major Matt R. Root, Surgeon N.G. Colo.
Surgeon John W. Ross, U.S.N.
Medical Director Walter K. Scofield, U.S.N.
Major Louis L. Seaman, *Surgeon U.S.V.E.
Hon. Leslie M. Shaw, Secretary of the Treasury.
Major John O. Skinner, Surgeon U.S.A.
Colonel Charles Smart, Assistant Surgeon General U.S.A.
Captain French W. Smith, Assistant Surgeon W.Va.N.G.
Lieut. Robert P. Smith, Surgeon D.C.M.
*Captain Myles Standish, Mass.V.M.
Lieut. Samuel C. Stanton, Illinois N.G.
Major Andrew S. Stayer, Surgeon N.G.Pa.
Brig. Gen. George M. Sternberg, Surgeon General U.S.A.
Major Walter S. Stewart, Surgeon N.G.Pa.
Lieut. Edward Stieren, Assistant Surgeon N.G.Pa.
Captain J. Hamilton Stone, Assistant Surgeon U.S.A.
Major Charles F. Sweet, Surgeon Rhode Island M.
Major G. Lane Taneyhill, Surgeon Maryland N.G.
Brig. Gen. Marshall O. Terry, *Surgeon General of New York.
Major Joseph H. Townsend, Surgeon Conn.N.G.
Lieut. David M. Trecartin, Assistant Surgeon Conn.N.G.
Mr. Charles Truax, Chicago, Ill.
Surgeon John F. Uri, U.S.N.
Major George Tully Vaughan, Surgeon U.S.M.H.S.
Assistant Surgeon B. S. Warren, U.S.M.H.S.
Captain Clarence A. Weaver, Surgeon D.C.M.
Lieut. Col. Joseph K. Weaver, Chief Surgeon N.G.Pa.
Passed Assistant Surgeon C. P. Wertenbaker, U.S.M.H.S.
Major Allen A. Wesley,* Surgeon U.S.V.
Surgeon Ferdinand W. F. Wieber, U.S.N.
Lieut. Christopher Earle Williams, Mass. V.M.
Surgeon Louis L. Williams, U.S.M.H.S.
Captain Francis A. Winter, Assistant Surgeon, U.S.A.
Medical Director John C. Wise, U.S.N.
Captain Francis J. Woodman, Surgeon D.C.M.
Major Arthur L. Wright, Surgeon N.G. Ia.
Major Marlborough C. Wyeth, Surgeon U.S.A.
Colonel Robert S. Young, Surgeon General of North Carolina.

*Not now in active service as such.

DELEGATES.

Lieut. Enrico Castelli, Surgeon Royal Italian Army.
Colonel Richard Exham, C. M. G., British R.A.M.C.
Medical Inspector S. Kimura, Imperial Japanese Navy.
Teniente Coronel Zacarias R. Molina, Mexican Army.
Colonel J. L. H. Neilson, Director General, Med. Serv. of Canada.
Colonel H. Nimier, Médecin principal de premiere classe, armée
française.
Captain K. Tamura, Surgeon Imperial Japanese Army.

FIRST SESSION THURSDAY MORNING, JUNE, 1902.

The opening session of the Association was called to order by Major GEORGE HENDERSON, Surgeon General of the District of Columbia Militia. Chairman of the Committee of Arrangements, at 10 o'clock A. M. in the New National Theatre. The auditorium was handsomely decorated with bunting and with many forms of the national colors. Upon the stage sat the President of the United States, and the Secretaries of War, the Navy, and the Treasury; the Surgeon Generals of the Army, the Navy, and the Marine Hospital Corps; the President of the Board of Commissioners of the District of Columbia and the President of the District of Columbia Medical Society; and the Officers of the Association. The Marine Band in their white summer uniform furnished music for the occas-



Major George Henderson.

ion. In the audience were many representatives of official and diplomatic society, and a large number of ladies graced the meeting by their presence.

The meeting was opened with an invocation by the Right Rev. HENRY Y. SATTERLEE, Bishop of Washington.

Major HENDERSON then introduced the Hon. THEODORE ROOSEVELT, President of the United States, who delivered the opening address, which was received with great enthusiasm.

Hon. HENRY B. F. MACFARLAND, Chairman of the Board of Commissioners of the District of Columbia, then welcomed the Association on behalf of the government and people of the District of Columbia.

Dr. S. S. ADAMS, President of the Medical Society of the District of Columbia, gave an address of welcome on behalf of that society.

Major Henderson then relinquished the chair to the President, Lieut. Col. JOHN VAN RENSSELAER HOFF, U.S.A., who after requesting the First Vice President, Brigadier General ROBERT A. BLOOD of Massachusetts, to preside, delivered his annual address.

The meeting was then adjourned to assemble in the convention hall of the New Willard Hotel at 1:00 o'clock P. M.

SECOND SESSION, THURSDAY AFTERNOON, JUNE 5, 1902.

The meeting was called to order by the President, at 1:00 P. M., in the Convention Hall of the New Willard Hotel.

The Executive Committee submitted a report through the Secretary Major JAMES EVELYN PILCHER, U.S.V.

The PRESIDENT:—The chair feels it his duty to call the attention of the Association to a number of very important points in this report which are to be decided by this meeting. I think we may be said to have reached the parting of the ways. The question of whether or not we shall publish a journal, whether or not we shall reduce the dues, and a number of other questions are here included. I wish you to bear that in mind before you vote on this resolution.

On motion of Medical Director JOHN C. WISE, U.S.N., the report was adopted as read.

The Treasurer, Lieutenant HERBERT A. ARNOLD, submitted his report, adding: "There are no outstanding obligations unless it be for a purchase of insignia which just reached me prior to this meeting and for which I have not as yet received the bill. As the insignia are now being issued, they would properly come under next year's work. I have no further comments to make on this report. As our finances improve, comments become less necessary." (Laughter.)

On motion of Major A. R. JARRETT, N. Y., the report was received and referred to an auditing committee to be appointed by the President.

The President appointed as members of the Auditing Committee:

Lt. Col. JOSEPH K. WEAVER, Pa.
Lieut. JOHN L. BRUBAKER, Pa.
Surgeon F. W. F. WIEBER, U.S.N.

The report of the Secretary and Editor, Major JAMES EVELYN PILCHER U.S.V., was read, the report of the Publication Committee, of which Major Pilcher is *ex officio* chairman, being included with the editorial report.

Major THOMAS C. CLARK, Minn.—I think only those who have had some experience in the Secretary's work can comprehend what that report means and only those who can look back to the early days of this Association and remember the reports of our then beloved Secretary, can realize how much the work of the last year has done to re-invigorate and place on a satisfactory living basis the Association which Secretary Chancellor did so much originally to establish.



New Willard Hotel.

I wish now, Sir, as preliminary to what I propose to offer later, to move that the report of the Secretary be accepted as read and the thanks of the Association tendered to him for the arduous, indefatigable, and thorough labor which he has bestowed upon and with which he has honored the office.

The PRESIDENT:—In connection with the work of the Secretary, extensive financial operations are involved. Therefore will you not add to your motion that an Auditing Committee be appointed to audit his report?

Major THOMAS C. CLARK, Minn.:—I move that the report be referred to an Auditing Committee to be appointed by the chair.

The motion being duly seconded, was unanimously carried.

Major THOMAS C. CLARK, Minn.:—I wish now to complete what I had in mind. I move you, Sir, that the Executive Committee be directed to fix a proper compensation to be allowed the Secretary for the work incumbent upon him in that office. It is unfair and unjust to ask any member of this Association to contribute his services without proper compensation, and no money can be better invested than to pay such a Secretary as we need, and such a one as we have, a proper compensation for the work which he does. Nobody is better able to determine what such compensation should be than the Executive Committee are, because they are in touch with the Secretary and his work and are the best qualified body to make such a recommendation.

Major G. LANE TANEYHILL, Md.:—I simply wish to suggest that perhaps it would be better if Major Clark were to offer an amendment to the constitution providing that the compensation of the Secretary and Editor shall be thus and so. This resolution, of course, can only apply to the present year because as an organization we can only take action for this one year.

Major THOMAS C. CLARK, Minn.:—I would say, Mr. President, that I prefer to leave it in the way I have stated and let the Executive Committee cover the whole case. I do

not wish to attempt to do it myself, because the matter requires a consideration of all the facts; but the Executive Committee I consider the most competent body to act upon the proposition, and I, for one, am entirely willing to accept whatever that body determines upon.

The motion was unanimously adopted.

The chair appointed as members of the committee to audit the accounts of the Secretary and Editor :

Medical Director, JOHN C. WISE, U.S.N.,
Col. R. HARVEY REED, Wyo.,
Major DANIEL M. APPEL, U.S.A.

Owing to the illness of Col. C. H. ALDEN U.S.A., the report of the Literary Committee of which he is chairman was read by Col. W. W. GRANT, Colo., a member of the committee.

On motion of Lieut. Col. J. K. WEAVER, Pa., the report was received and accepted.

The PRESIDENT:—I think it is due to the Literary Committee, and particularly to the chairman of that committee, Col. Alden, to say that the Executive of the Association, and I am sure the Association in general, feels it is under very great obligations for the magnificent work done by the Literary Committee. I do not think that in the history of the Association there has ever been a program so rich as that which will be presented for your consideration.

Major THOMAS C. CLARK, Minn:—I move you, Sir, that the Association return its thanks to Col. Alden as chairman of the Literary Committee for the labor it has expended in preparing its program, and that we not only extend our thanks for his labor but our sympathy with him in his illness and our very great regret that he is unable to be present; and that Col. Alden be so notified on behalf of the Association.

This motion being duly seconded was unanimously carried.

Col. WILLIAM H. FORWOOD, Asst. Surg. Gen. U.S.A., submitted the report of the Committee on Credentials. On account of the largely statistical nature of this report, the reading of it was dispensed with.

On motion of Col. WINSLOW ANDERSON, Calif., the report was accepted and placed on file.

The Committee on Necrology through its chairman Medical Director GEORGE PERLEY BRADLEY, U.S.N., submitted its report.

The PRESIDENT:—

“One bugle note their battle call,
One watchword, Duty, that is all.”—

The members of the Association will please arise in token of respect for our dead comrades and as my authority that this report be received as read.

Major ALBERT H. BRIGGS, N. Y., presented the report of the Committee on Transportation.

On motion of Medical Inspector S. H. DICKSON, U.S.N., the report was received and accepted.

The PRESIDENT:—The next regular report on the list is that of the Committee of Arrangements but as this committee through its chairman submitted practically its report this morning at the general meeting, I presume there is nothing further to be said.

The report of the special Committee on Post Exchange being called for, Maj. T. C. CLARK, Minn., stated that he was a member of that committee but had never received any communication from the chairman or any other member of the committee and that he had no report to make.

Maj. ALBERT H. BRIGGS, N. Y.:—I move that the question of the report be laid on the table.

Col. W. W. GRANT, Colo.:—Does that dispose of this question entirely?

The PRESIDENT:—No it can be called up at any time the meeting may desire.

The motion being seconded was adopted.

The report of the Committee on the Enno Sander Prize was presented by the Secretary, whereupon the President opened the envelope bearing the superscription “Aryvel” and announced the name of the winner of the prize, Lieut. Col. VALERY HAVARD, Deputy Surgeon General U.S.A., which was greeted with great applause.

The President next opened the envelope bearing the superscription "Adelante" and read the name of the essayist receiving honorable mention, Capt. FREDERICK P. REYNOLDS, Asstant Surgeon U.S.A., which evoked generous applause.

The President announced that the Treasurer had in his possession \$100.00 in gold but that the gold medal had not yet been received; that he would turn over to Col. Havard with the congratulations of the President of the Association of Military Surgeons, and he believed those of the Association itself, the \$100.00 in gold, and as soon as it should be received, the gold medal. [The medal was received the day after the meeting and duly conferred.]

The PRESIDENT:—I desire to call your attention to the fact that the Association is honored by the presence at this meeting of the following delegates from abroad:

Col. Richard Exham of the British Army;
Col. J. L.H. Nielson, Director General of the Canadian Medical Services;
Lieut. Col. Z. R. Molina of the Mexican Army;
Prof. H. Nimier of the French Army;
Medical Inspector S. Kimura of the Japanese Navy;
Capt. K. Tamura of the Japanese Army;
Capt. Enrico Castelli of the Italian Army. .

I am sure that we feel very proud that such distinguished gentlemen have done us the honor to come so far to give us the pleasure of their presence and the advantage of their counsel; and I am positive that every member of the Association will extend the right hand of fellowship to these gentlemen and show them every possible courtesy. (Applause.)

Col. W. W. GRANT, Colo.:—I move that a vote of thanks be tendered the foreign governments who have thus honored us and our government in sending representatives to this meeting; and I would ask if it is necessary to make a motion that these delegates may participate in our discussions.

The PRESIDENT stated that a motion was not necessary to enable the delegates to participate in the discussions as they had been invited by the authority of the Executive Commit-

tee, and they were expected and desired to take part in the discussions.

The motion of Col. Grant that the Association through its President present its compliments and acknowledgements to the governments that have honored the Association by sending representatives to this meeting was unanimously carried.

THE PRESIDENT:—I wish to call the attention of the Association to the fact that it is customary to appoint a Nominating Committee early in the session so that that Committee can determine upon its course of action. The representation on the Nominating Committee of the different states and organizations is as follows, and I would be obliged to the members from the different states and organizations if they will get together and appoint one, or more if desired—but at least one—to represent their respective states and organizations on the Nominating Committee. The gentlemen will please send in the names to the Secretary at the earliest possible moment. The Committee will be expected to submit the result of its work on the afternoon of Saturday.

REPRESENTATION ON THE NOMINATING COMMITTEE.

Alabama,	-	-	1	Maryland,	-	-	1
Arizona,	-	-	1	Massachusetts,	-	-	4
Arkansas,	-	-	1	Michigan,	-	-	1
Army,	-	-	20	Minnesota,	-	-	1
California,	-	-	1	Missouri,	-	-	2
Colorado,	-	-	1	Montana,	-	-	1
Connecticut,	-	-	2	Navy,	-	-	7
District of Columbia,	-	1		Nebraska,	-	-	1
Florida,	-	-	1	Nevada,	-	-	1
Georgia,	-	-	1	New Hampshire,	-	-	1
Illinois,	-	-	3	New Jersey,	-	-	1
Iowa,	-	-	1	New York,	-	-	5
Kansas,	-	-	1	North Carolina,	-	-	1
Kentucky,	-	-	1	Ohio,	-	-	3
Louisiana,	-	-	1	Pennsylvania,	-	-	4
Maine,	-	-	1	Rhode Island,	-	-	1
Marine Hospital Service,	-	4		South Carolina,	-	-	1

South Dakota,	-	-	I	Virginia,	-	-	I
Texas,	-	-	I	Washington,	-	-	I
Utah,	-	-	I	West Virginia,	-	-	I
Vermont,	-	-	I	Wisconsin,	-	-	I
Wyoming,				-	-	I	

Major A. H. BRIGGS, N.Y., moved that each organization or state send one representative to the Nominating Committee to cast the number of votes to which its membership entitled it.

Medical Director, JOHN C. WISE, U.S.N.:—It is absolutely immaterial how many each state has on the Committee as the vote is taken according to membership.

Major THOMAS C. CLARK, Minn.—The plan suggested by Major Briggs has this benefit that the discussion in regard to the wishes of each state or organization is worked out in its own delegation and is not brought into the Nominating Committee to take up its time.

The motion being seconded, was adopted.

Major A. R. JARRETT, N. Y.:—I would like to ask how the contract surgeons vote as an organization?

The PRESIDENT:—If they belong to the army, they are represented by the army; if to the navy they are represented by the navy; if to the marine hospital service, they are represented by that service.

On motion of Col. W. W. GRANT, Colo., the meeting was adjourned until 8.00 P. M.,

From 4.30 to 6.30 P. M. the Army Hospital Corps Company of Instruction at Washington Barracks gave an exhibition drill which was witnessed by the members of the Association. The drill was given in two parts: 1. The pitching, striking and packing of a Regimental Field Hospital, showing the distribution of the personnel, the arrangement of the tents, and the organization of the different departments, including the location and use of the articles of the U. S. Army Field Hospital equipment. 2. First aid exercises, showing the work of an ambulance company during an action including: First aid to the wounded; their transportation to the rear; wounded removed from the field by regulation litter, by

improvised litter, and by blanket litter; without litter, with one or more bearers, on horseback and on travois; and by ambulance. At the conclusion of the drill a collation was served.

THIRD SESSION THURSDAY EVENING, JUNE 5, 1902.

The Association was called to order by the President at 8:00 P. M.

Medical Director JOHN C. WISE, U.S.N.:—I wish to submit the report of the Committee appointed to audit the accounts of the Secretary and Editor. It finds the accounts technically correct, and in addition it wishes to express its great satisfaction with the care and system with which they have been kept. It is the opinion of your committee that the Secretary and Editor is worthy of full compensation for such laborious service.

On motion of Col. WINSLOW ANDERSON, Calif., the report was received and accepted.

The literary program was next taken up. The prize essay was first on the list but as the committee had not yet returned it to Col. Havard, the President announced that if there was no objection the reading of it would be postponed until the following session.

The PRESIDENT:—The chair understands it to be the sense of the meeting that the control of the literary program shall rest in it and if there is no objection that will be accepted as the rule.

The first paper to be read was that entitled "Education of Medical Officers for the Public Service," by Medical Director John C. Wise, U. S. Navy.

The paper was discussed by Major WALTER REED, U.S.A. and the author.

The next number on the program was "The Qualifications and Selection of Medical Officers," by Lieut. Colonel Charles Adams, Asst. Surg. Gen., N.G. Illinois, which was read by title.

The next number on the literary program was "Character Study in Examination of Persons for Military Service,"

by Medical Inspector F. B. Stephenson, U.S. Navy, which was read by title.

The next paper on the program was "The Recruit," by Lieut. S. C. Stanton, Asst. Surg. N.G.III.

This paper evoked an animated discussion by Col. EXHAM of the British Army, the PRESIDENT, Med. Insp. S. H. DICKSON, U.S.N., Col. L. B. ALMY, Conn., Med. Dir. JOHN C. WISE, U.S.N., and Maj. W. C. BORDEN, U.S.A.

The next number on the program was "The Relations between Volunteer Aid Societies and the Public Medical Services," by Major George G. Groff, Brigade Surg. U.S.V., which was read by title.

The next paper on the program was "Valor as an Incident of Medico-Military Service," by Major JAMES EVELYN PILCHER, Brigade Surgeon U.S.V., Captain U.S.A. retired, which was also read by title.

The next paper on the program was "Operations of the Medical Department at the Battle of Antietam," by Colonel William H. Forwood, Asst. Surg. Gen. U. S. Army, which took the same course.

The next paper of the program was "The Ohio Volunteers in the War with Spain," by Lieut. Col. H. M. W. Moore, Chief Surg. Ohio N.G. There being no objection, the President ordered this paper to be read by title.

The next paper on the program was "Observations on the Campaign in Western Porto Rico during the Spanish-American War," by First. Lieut. Bailey K. Ashford, Asst. Surg. U.S. Army, which was read by title.

The next paper was "The Ideal relation for the Medical Department of an Army," by Major W. O. Owen, Surgeon U.S.A.,—read by title.

The next paper on the program was "The Executive Element in the Training and Skill of a Military Surgeon", by Dr. John N. Goltra, Contract Surgeon, U.S.A.

The reading of this paper brought out an extended and interesting discussion by Lieut. Col. VALERY HAVARD, U.S.A., Major D. M. APPEL, U. S. A., Colonel NIELSON of the Cana-

dian forces, Captain E. L. MUNSON, U.S.A., Lieut. Col. N. S. JARVIS, N. Y., Major A. R. JARRETT, N. Y., Major A. H. BRIGGS, N. Y., and Major AZEL AMES, U.S.V.

This brought to a conclusion the first section of the literary program.

The PRESIDENT:—I desire to bring before the Association a question of the interpretation of the constitution on this point: The constitution as amended reads that the receiver of the first honorable mention shall be made a life member, and it is the desire of the chair, if the Society so decrees, that this provision shall extend to the first honorable mention of this year. Will any one present that in the form of a motion?

Major W. C. BORDEN, U.S.A.: I move that this clause be extended to cover the present year.

Major A. H. BRIGGS, N. Y.: I would amend that motion by substituting the word "interpreted" for "extended".

This amendment was accepted by Major Borden, and the motion was unanimously carried.

On motion of Major A. H. BRIGGS, N. Y., a recess was taken until nine o'clock Friday morning.

FOURTH SESSION, FRIDAY MORNING, JUNE 6, 1902.

The Association was called to order by the President, at 9:00 A. M.

Major W. C. BORDEN, U.S.A.:—I ask the President's permission to formally present a matter of business which seems to me to be of considerable importance to this Association, in view of the suggestion made by the President of the Association in his address yesterday, which suggestion was in part acted upon by the Executive Committee in presenting a resolution that this Society receive a charter. We all know how this Society has grown. It is unnecessary for me to go over this ground. Starting as a small organization it has gradually developed until now it comprises practically every military medical part of the services of the United States and the National Guard; that is, it comprises medical officers of the Army, of the Navy, of the Marine Hospital service, of the

National Guard, contract surgeons who have been in service or are in service, and surgeons of volunteer forces. In this way therefore our Association is an extremely representative one; but it is still only semi-official, or possibly entirely unofficial. It has, however, received the support, as we all know—the unqualified support—of the chiefs of the different bureaus, of the Secretary of War, the Secretary of the Navy, the Secretary of the Treasury, and as we know yesterday by the address of the President it has the unqualified approval of the President of the United States. But this is simply approval. It has no official standing as yet. The remarks of our able President yesterday and the action of the Executive Committee which was adopted by the Association, were to the end of making the Association so far as possible an official one. It seems to me that this can be done only by congressional action, and to that end I recommend that this Association be incorporated, with certain special provisions of incorporation. I have here a copy of an act of incorporation which is divided into three sections and which covers, it seems to me, three very important points. The first section deals entirely with the incorporation of the Association, naming in the section different members of the Association, as it is necessary in all incorporation acts to name certain persons who shall be members of the incorporation. In selecting these names three points have been borne in mind: First, we have taken the President and the ex-Presidents of the Association and the Association officers. Next we have named the Surgeon Generals of the three different branches, that is, the Army, the Navy, and the Marine Hospital Service. We have then taken from the National Guard such prominent members of the Association as come from the States or have relations with the Judiciary Committees of the two Houses of Congress, before whom this act will have to go, for it will be necessary that the judiciary committees of the House and Senate favorably report upon this act in order to have it passed. In the first section also is embodied, as is usual in incorporation acts, the purposes of the Association. The act is as follows:

AN ACT

TO INCORPORATE THE ASSOCIATION OF MILITARY SURGEONS OF THE UNITED STATES.

Be it enacted by the Senate and the House of Representatives of the United States of America, in Congress assembled, That *George M. Sternberg*, of the Army, *Presley Marion Rixey* or the Navy, *Walter Wyman* of the Marine Hospital Service, *Nicholas Senn* of the Illinois National Guard, *Jefferson Davis Griffith* of the National Guard of Missouri, *John Van Rensselaer Hoff* of the Army, *Robert A. Blood* of the Massachusetts Volunteer Militia, *Leonard B. Almy* of the Connecticut National Guard, *Nelson H. Henry* of the National Guard of New York, *J. Francis Calef* of the Connecticut National Guard, *George Henderson* of the District of Columbia Militia, *Charles F. W. Myers* of the National Guard of New Jersey, *John V. Shoemaker* of the National Guard of Pennsylvania, *Angelo Festorazzi* of the Alabama State Troops, *Edmund C. Brush* of the Ohio National Guard, *Frederick W. Byers* of the Wisconsin National Guard, *James T. Priestley* of the National Guard of Iowa, *James Evelyn Pilcher* of the Army, *Winslow Anderson* of the National Guard of California, *Charles H. Alden* of the Army, *William W. Grant* of the National Guard of Colorado, *Robert Harvey Reed* of the National Guard of Wyoming, *Thomas C. Clark* of the Minnesota National Guard, *Robert A. Marmon* of the Navy, *Myles Standish* of the Massachusetts Volunteer Militia, *John C. Wise* of the Navy, *George T. Vaughan* of the Marine Hospital Service, *Albert H. Briggs* of the National Guard of New York, *William C. Borden* of the Army, *Charles P. Wertenbaker* of the Marine Hospital Service, *Otis H. Marion* of the Massachusetts Volunteer Militia, and their associates and successors, are hereby created a body corporate and politic, in the District of Columbia, by the name of the ASSOCIATION OF MILITARY SURGEONS OF THE UNITED STATES, for the purpose of advancing the knowledge of Military surgery, medicine and sanitation in the medical departments of the Army, the Navy and the Marine Hospital Service of the United States, and of the militia of the different states, and to increase the efficiency of the different services by mutual association and the consideration of matters pertaining to the medico-military service of the United States in peace and in war.

SEC. 2. That the Secretary of the Treasury, the Secretary of War, the Secretary of the Navy, the Surgeon General of the Army, the Surgeon General of the Navy and the Surgeon General of the Marine Hospital Service shall be ex-officio members of the Association of Military Surgeons of the United States, and, with the President of the Association shall act as an advisory board to the said Association.

SEC. 3. That said Association is authorized to hold real and personal estate in the United States, so far only as may be necessary to its lawful ends, to an amount not exceeding One Hundred Thousand Dollars, and may adopt a constitution and make by-laws not inconsistent with law, and may adopt a seal, and an insignia which may be worn by its members.

If now this Association is incorporated with the Surgeon Generals of the three different services among the incorporators, and with the Secretaries of these services as ex-officio members and as an advisory board, and the insignia of the Association is approved by Congress, the Association immediately becomes in every way strictly an official one, and members of the Association can wear the insignia whenever they wear their uniform and with the approval of Congress itself. I submit this to the Association for such action as it may see fit to take.

Major AZEL AMES, U.S.V.: I rise to ask a question, and that is whether or not it is expected to secure legislation at this session of Congress. If so, I have nothing further to say. If, on the other hand, it is not likely that it can be accomplished this year, the experience I have had in somewhat similar bodies in the past would lead me to offer merely a suggestion in regard to what might perhaps be done in the intervening time before the next Congress assembles. I should be glad if the chair would indicate what the probabilities are in regard to this.

Major W. C. BORDEN, U.S.A.: I would like to say in regard to that, that it is my intention, after the discussion of this proposition, if there seems to be approval of the plan, to make a motion that the matter be referred to the Executive Committee with power to act, and another motion that a committee of three, including members of this Association from Massachusetts, be delegated to wait upon the chairman of the Judiciary Committee of the Senate immediately and lay the proposition before him and get his opinion in regard to it. The members from Massachusetts are now in this city and Senator Hoar can be readily reached, and the matter should at once be brought to the attention of the Committee and then receive such information from them—practically official—as to what could be done in the matter. The same action could be taken in regard to the Judiciary Committee of the House.

Major AZEL AMES, U.S.V.:—I thank Major Borden for the information which he gives, but it does not quite reach

the point. I understand that the contemplation is that Congress may adjourn on the first of July, and if so I am afraid there would hardly be time to secure action by the Judiciary Committee. Of course it could be railroaded through, but I have some doubts whether it could be accomplished at this session. If it cannot I should hope that there would be a committee appointed who might sit during the recess in regard to this incorporation—which I think we all agree as being desirable—and thus have time for that mature reflection which I am sure would give to us many points which would be of advantage and avoid amendments that we might have to seek later on. This will be a pretty big job on the lines that Major Borden has laid down. I am not prepared to say that every one of them is not excellent—most of them as I understand them would certainly have my cordial approval; but there are conditions which have arisen in connection with national incorporations of this kind, and with state incorporations, which have left cause for regret. I should hope to make as good an Association under the act of incorporation as I believe this can be made into, avoiding the unfortunate mistakes that have been made by other bodies that have attempted the same; and that is why I should not be altogether sorry, frankly, if the intervening time between this and the next session should be afforded to the proper committee having the matter in charge to consider minutely and carefully the points which are involved. I will not take the time of the Association at this moment in enumerating some of them, but they do exist and have been causes for a good deal of trouble in similar attempts. The National Board of Health and its experience in this city is painfully well known to many of the members of this Association and to the later organizations which have had the same undertakings on foot. I believe, Mr. President, that the suggestion of a conference is most excellent, and certainly we are all agreed as to the wisdom of some incorporation of this kind. It probably can come best from Congress rather than from any of the States.

The PRESIDENT: Will Captain Marmion of the Navy give us his views in regard to this subject?

Medical Director R. A. MARMION, U.S.N.:—I was not here when the remarks began on this subject so that I am sorry to say I cannot speak of them as much as I would like to. But as you are probably aware I have had a good deal to do with efforts to get recognition of the Association in another shape and it resulted most disastrously. But as a principle I am decidedly and cordially in favor of incorporation. It seems to me that it is the only way of accomplishing the ends which we are all aiming at. There are so many points to be taken into consideration in carrying this subject through successfully that I do not believe it will ever be done except through incorporation. I think it is feasible in that way, and I believe that is the only way in which it is. After devoting the greater part of a term of Congress to securing favorable legislation, I failed totally. I thought I had accomplished everything we needed. I had secured practically the unanimous support of both military committees in Congress, but to my amazement at the very last moment I found that my work had all gone to pieces, and a single unfavorable endorsement killed the work of the whole Congress; and that same accident I think is likely to happen to any one who attempts to get such recognition as is needed by this Association through a charter from Congress. I repeat that incorporation is the only way for us to secure it.

The PRESIDENT: I think perhaps it is due to the Association to explain exactly to what effort you refer in the way of recognition and exactly why it failed.

Medical Director MARMION: The efforts to which I refer were made by a committee consisting of your honorable self, a member of the National Guard from the State of New York, and myself, and the object was the recognition by Congress of the Association in such shape as to enable the officers of the army and navy to wear the insignia of the order on occasions requiring uniform.

The PRESIDENT: The same as a patriotic society?

Medical Director MARMION: The same as is now extended to patriotic societies. We maintain that our Association is a

patriotic society within the meaning of the term as applied to others, and a very strong paper was made out setting forth our claims on that basis. Some efforts were made to help secure such recognition by the various states which had any organization at all and good progress was made with the states, and I felt that perfectly satisfactory progress had been made with the national legislature; but at the very last moment these papers were I think as a matter of routine referred to the War Department for endorsement. The bill which was introduced and asked to be put on its passage mentioned the officers of the army and navy. It was referred to the committees on military affairs in both Houses, and they as a matter of routine referred it to the Secretary of War. The Secretary of War sent it at first to Surgeon General Sternberg and he gave it a very strong endorsement indeed. It went next to the Adjutant General's Office, and it received a very unfavorable endorsement there, as also from General Miles, and it was then sent back to the military committee of the Senate loaded with these condemnations. It was at once indefinitely postponed, so that the committee from being, as I can safely say, unanimously in favor of the bill, suddenly dropped it and that was the end of it. Since then there has been nothing done that I know of in Congress. I think that incorporation is the only show that we have of obtaining what we want.

Major W. C. BORDEN, U.S.A.: I might say in regard to this that since stating my intention to make a motion to refer it to the Executive Committee with power to act, I have had a conference on the subject with the President of our Association, and it was the intention of the Executive Committee to see the Secretary of the Treasury, the Secretary of War, and the Secretary of the Navy, and the Surgeon Generals of the different branches, in order to obtain their support of this incorporation.

I move you, Mr. President, that this be referred to the Executive Committee for action.

A vote being taken on the motion it was unanimously carried.

Major W. C. BORDEN, U.S.A.: I now move you, Sir, that a committee of three, including the members present from Massachusetts, be appointed by the chair to wait upon the chairman of the Judiciary Committee of the Senate to lay this proposition before him, as it will come most prominently before him and he will have to act upon it, and obtain his views upon the subject.

This motion upon being put to a vote was unanimously carried.

Major W. C. BORDEN, U.S.A.: I move you, Sir, that a committee of three be named by the President of the Association to confer as soon as possible with the chairman of the Judiciary Committee of the House in regard to this matter.

This motion being voted upon was carried.

The literary program was then resumed, the first paper to be read being the prize essay, "The Most Practicable Organization for the Medical Department of the United States Army in Active Service," by Lieut. Col. Valery Havard, Deputy Surg. Gen., U.S.A., the reading of which as the first number on the program was postponed from the previous session.

Col. Havard was enthusiastically applauded as he concluded the reading of his paper.

The PRESIDENT: I am sure the Association will join with the chair in congratulating the medallist upon the excellence of his essay, which is really a complete epitome of the work of an army in active service. This matter is of so much importance, and the time is so short before the Association will proceed to become the guests of the Navy, so to speak, in the excursion upon the despatch boat "Dolphin," that I would suggest that no discussion be had upon the essay at this time; but that it be published in the *Journal* of the Association and that the members be invited to discuss the paper by communicating their views to the *Journal*, as is the custom with the Military Service Institution in New York, where very important papers are presented. The chair will be very glad to know the desire of the Association in regard to the disposition of this paper.

Colonel W. H. FORWOOD, U.S.A.: I move that the discussion be postponed for the present, as the time is rather short before we go on this excursion.

Major T. C. CLARK, Minn.:—I move that the matter be brought up as the first order of business in the literary program to-night and be decided then.

Colonel W. H. FORWOOD, U.S.A.: I accept the suggestion of Major Clark. I desire to say, however, that as I will probably not be able to be down this evening, and as I had something to say in discussion of the paper, I would prefer that it would take place at some other time. However, it does not make much difference.

Major T. C. CLARK, Minn.: I certainly did not wish to interfere or prevent Colonel Forwood taking part in the discussion. I simply did not want to have the matter settled now when but few members are here, but to set an hour for discussion at another time. I certainly wish to hear Colonel Forwood's discussion.

Medical Director JOHN C. WISE, U.S.N.: For myself I am decidedly in favor of the suggestion of the President—that the paper be discussed through the medium of the *Journal*. I think that proposition is first in order.

The PRESIDENT: Do you make that in the form of a motion?

Medical Director, JOHN C. WISE, U.S.N.: I simply wish to say that I am in favor of the proposition which the President made.

Major W. F. LIPPITT, U.S.V.: I move to amend the motion already before the house to make this discussion take place through the medium of the *Journal*. The paper is too long for us to discuss properly at the present time. I would further state that I would personally not wish to have anything to say.

This motion, being duly seconded, was carried.

Major T. C. CLARK, Minn.: I would like to ask if there has been any meeting called of the Nominating Committee.

The PRESIDENT: I regret to say that the chair has been

unable thus far to induce the different members entitled to vote to complete the Committee by sending in the names. I think possibly I may be able to do that as we go down the river to-day.

As the hour has arrived when it will be necessary for this Association to take a recess and proceed to the Navy Yard, if there is no objection the Association will now take a recess to meet here at eight o'clock, to-night.

FIFTH SESSION FRIDAY EVENING, JUNE 6. 1902.

The meeting was called to order by the President at 8:00 P. M.

The literary program was resumed, the first paper being "A Short Account of Mosquito Work in Havana, Cuba," by Major W. C. Gorgas, Surgeon, U.S.A., which at the request of the author was read by title.

The next paper on the program was "The Prophylaxis of Certain Diseases incident to Camps in Time of War," by Passed Asst. Surg. H. D. Gedding, U.S.M.H.S., which was also read by title.

The next paper to be read was that entitled "Preventable Diseases in the Army," by Prof. Geo. M. Kober, late U. S. Army, which on motion was referred to the Publication Committee.

The following papers next were read by title:

"Quarantine in its Relations to Military Operations," by Surg. A. H. Glennan, U.S.M.H.S.

"Some Practical Suggestions on Tropical Hygiene," by Major H. P. Birmingham, Surgeon, U.S.A.

The next paper to be read was "Management of Small Pox," by Passed Assistant Surg. C. P. Wertenbaker, U.S.M.H.S., which on motion was accepted and referred to the Publication Committee.

Lieut. Col. J. K. WEAVER and Lieut. J. L. BRUBAKER, the committee appointed to examine and audit the books of the Treasurer reported that, "the members of the Auditing Committee have examined the books of the Treasurer and find them correct. As the labor of the Treasurer is increasing

and it is necessary to have clerical help it would recommend that one hundred dollars be allowed for this purpose."

On motion the report was adopted.

The PRESIDENT: I wish again to call the attention of this meeting to the fact that we have not yet all the names of the Nominating Committee. Kentucky, Maine, Missouri, New York, North Carolina, and Wisconsin are not represented. It is the desire that that Committee meet at the earliest practicable moment and I should like to have all the States mentioned have representatives on the Committee.

Major T. C. CLARK, Minn.: I would respectfully represent that it would be proper to set a time for a meeting of the Nominating Committee. I do not think that the Association should wait for the action of any States that do not take interest enough to present the names of members of that Committee.

The PRESIDENT: While the lamp holds out to burn we can always get, perhaps, a nomination.

Major T. C. CLARK, Minn. We sinners of lesser degree I think have some rights in the matter, too. (Laughter.)

Representatives from the States mentioned were then designated for appointment on the Nominating Committee, and the Committee was instructed by the President to meet at ten o'clock P. M.

The President then nominated committees to confer with the Judiciary Committees of both Houses of Congress in regard to the incorporation of the Association, as follows:

FOR THE SENATE:

Surgeon General Robert A. Blood, M.V.M.,
Captain Myles Standish, M.V.M.,
Medical Director R. A. Marmion, U.S.N.

FOR THE HOUSE:

Lieut. Col. O. H. Marion, M.V.M.,
Brig. Gen. M. O. Terry, N. Y.,
Major William C. Borden, U.S.A.

Major W. C. BORDEN, U.S.A.: It would perhaps be well to say to the Association in regard to the subject of incorporation that the Judiciary Committee of the House has been consulted in regard to this act and have passed a favorable opinion

upon it; but they desire before taking action that it receive the approval of the Secretary of War, the Secretary of the Navy, and the Secretary of the Treasury, as the names of these honorable gentlemen are mentioned in the act of incorporation as *ex-officio* officers of the Association. In order to obtain the consent to the use of their names in this act of incorporation, I move that three committees be appointed by the chair, a committee to wait upon each of the Secretaries named.

This motion being duly seconded, was carried.

The President appointed the following committees:

TO CONFER WITH THE SECRETARY OF THE TREASURY:

Major D. S. Fairchild, Iowa;
Major A. L. Wright, Iowa;
Lieut. Col. J. M. Barstow, Iowa.

TO CONFER WITH THE SECRETARY OF WAR:

Brig. Gen. M. O. Terry, N. Y.;
Major W. C. Borden, U.S.A.;
Major A. H. Briggs, N.G.N.Y.

TO CONFER WITH THE SECRETARY OF THE NAVY:

Medical Director R. A. Marmion, U.S.N.;
Surgeon General P. M. Rixey, U.S.N.;
Brig. Gen. R. A. Blood, Surg. Gen., M.V.M.

The literary program was resumed and the following papers were then read by title:

"Anti-Typhoid Inoculations," by Dr. E. H. Wilson, Director of Bacteriology, Hoagland Laboratory, Brooklyn, N. Y.

"The Sanitary Work of the U.S. Army Medical Department in Alaska," by Major R. G. Ebert, Surg. U.S.A., late Chief Surg., Dept. of Alaska.

"Public Hygiene in Porto Rico," by Capt. José Lugo-Viña, Asst. Surg. P. R. Regt. U.S.A.

On account of Major D. M. Appel, Surgeon, U.S.A., having to leave the city at an early hour, his paper, "The U.S. Army General Hospital and Sanatorium for Pulmonary Tuberculosis at Fort Bayard, N. M.," illustrated by a number of diagrams, was by unanimous consent advanced on the program and read by the author.

Major T. C. CLARK, Minn.: I move that Major Appel's paper be accepted and follow the usual course, and in addition that the thanks of this Association be tendered Major Appel for the great care and labor he has bestowed upon it and the manner in which it has been presented by means of these charts, which convey a very clear and distinct idea of what I consider one of the most remarkable experiments that has been made in this country for the amelioration of one of the most destructive diseases. I move, therefore, that a vote of thanks be tendered Major Appel.

The motion being duly seconded was unanimously carried.

Col. J. H. L. NIELSON, of the Canadian Forces, then addressed the Association extemporaneously, describing a transport and ambulance wagon which he designed last autumn for the 10th field hospital of the Canadian Army Medical Corps. His remarks were listened to with great interest, and with his consent and by direction of the Association were embodied in the proceedings.

Col. RICHARD EXHAM, of the British Army, then read a paper dealing with special experiences in South Africa.

At its conclusion the PRESIDENT said: I am sure that the Association is deeply indebted to Col. Exham for this splendidly practical exposition of his experiences in South Africa. There is no paper that we have listened to, of the many valuable papers presented to this Association, which has so clearly brought to us the practical side of our work in time of war, and I believe that it is due the distinguished delegate from the British Army that we give him a vote of thanks, and I should be very glad to have a member move a vote of thanks to Col. Exham.

Upon motion of Med. Insp. S. H. DICKSON, U.S.N., a vote of thanks was unanimously tendered Col. Exham for his valuable paper.

Col. EXHAM: I thank you most sincerely for the way you have received me. I did not expect you would receive my very crude remarks in the way you have.

The Nominating Committee, through Major T. C. Clark, Minn., submitted its report, as follows:

For President, Gen. ROBERT A. BLOOD, M.V.M.;

For First Vice President, Medical Director J. C. WISE, U.S.N.;

For Second Vice President, Surg. Gen. WALTER WYMAN, U.S.M.H.S.;

For Secretary, Major JAMES EVELYN PILCHER, U.S.A.;

For Treasurer, Lieut. HERBERT A. ARNOLD, N.G.Pa.

An invitation for the Association to meet in BOSTON in 1903 was accepted, and the time of meeting left to the Executive Committee.

The PRESIDENT: You have heard the report of the Nominating Committee, and if there is no objection a vote on these nominations or any other nominations will be taken at the session tomorrow afternoon.

The PRESIDENT: I have intended from the very beginning of this meeting, and it has been brought to my mind and particularly impressed thereon by the remarks of our distinguished delegate from the British Army, to especially invite the attention of the members of this Association to the exhibit of Mr. Maignen, of Philadelphia, who is, as you know, the water expert. What he does not know about water is not worth knowing; and when you are over there at the Light Infantry Armory please go and see what he has to show you.

On motion of Lieut. Col. J. K. WEAVER, Pa., the Association adjourned to meet Saturday morning at nine o'clock.

SIXTH SESSION, SATURDAY MORNING. JUNE 7, 1902.

The meeting was called to order by the President at nine o'clock.

The literary program was resumed, the first paper to be read being "The Experience of the U. S. Navy with Yellow Fever on Board Ships," by Surg. F. W. F. Wieber. U.S.N.

The PRESIDENT: Gentlemen, you have heard this very interesting and timely paper, and I wish that the many questions therein brought up might be discussed at this meeting did time serve, but I am in hopes that when the paper appears in our Journal, it will evoke written discussion. We are at this time strongly inclined to the belief that

there is one principal source of yellow fever infection—the Stegomyia—and that all cases originate in this way; but we are not absolutely sure that such is the fact. There may be other means of hypodermic injection besides the proboscis of the mosquito,—there may be other insects that convey the infection; but we are certain about the mosquito.

The President then introduced Capt. K. Tamura, Surgeon Japanese Army, delegated by his government to represent that service at this meeting, who read a paper entitled "Original Medical Investigation by a Japanese Military Surgeon." It was followed with close attention and given generous applause when concluded.

The PRESIDENT: I am sure that you have listened with great pleasure and great profit to this most interesting paper by our colleague from Japan, and while of course we all know the wonderful strides making by that nation to-day, it needs just such an exposition as this to make us realize those strides. One thing impressed me particularly in this paper. You will recall in relating the experiment in Formosa that the protected troops developed not a single case of malaria, and I thought to myself of the reason for this. It is because the protected troops did exactly to the letter what they were told to do. I have never seen in the course of my somewhat wide experience any soldiers who obeyed so literally the letter of the law as the Japanese troops do.

Col. W. W. GRANT, Colo.: I move that this paper be referred to the Committee on Publication, with the thanks of the Association to the gentleman for his excellent paper.

Major T. C. Clark, Minn.: I wish to express our appreciation of the long distance which our colleague has traveled simply to visit us. We sometimes make the complaint that we have to go as far east as Boston or as far west as Chicago to attend the meetings of the Association. Here is a colleague who has come half way around the world. It is a lesson to us not to complain when the place of meeting is at a little distance from us.

The motion to refer Capt. Tamura's paper to the Publi-

cation Committee and to extend the thanks of the Association to him for his excellent paper, and its appreciation of the interest taken in the Association as indicated by the great distance traveled, was unanimously carried.

Col. W. W. GRANT, Colo.: I wish to occupy but a moment of your time. You are all perhaps familiar with the Dick bill, before the House of Representatives, with reference to the reorganization of the National Guard of the country. That bill has been referred to the committee and is now in their hands and ready to be adopted as soon as it can be called up. I have not the time to read it here, but it is acceptable. The President of this Society is familiar with it; and every National Guard and Army surgeon should welcome it as the established law of the land. The resolution which I wish to present is as follows:

Resolved, That the Association of Military Surgeons of the United States recommends the passage of Bill No. 11654, known as the Dick Bill, favorably reported by the Committee on Militia in the House of Representatives, of which Hon. Charles Dick is chairman, as it meets the requirements of the National Guard of all the States and Territories.

Col. R. H. REED, Wyo.; I wish to favor the resolution. I have read the bill carefully. I believe it to be a good bill, one which will improve our National Guard to a very great extent.

The resolution was put to a vote and unanimously adopted.

Passed Asst. Surg. C. P. WERTENBAKER, U.S.M.H.S.: In your annual address, Mr. President, you referred to the necessity for the establishment of a military medical school in which all of the officers of the Army, Navy, Marine Hospital Service, and possibly those of the National Guard, might obtain medical training, to fit them to become officers of the different services. In order to bring the matter before the Association and to get its sense, I wish to offer the following resolution:

Resolved, That it is the sense of this Association that a school for the training of medical military officers has become a necessity, and its establishment is recommended.—

and I move that a committee be appointed by the chair to for-

mulate plans, etc., and report at the next annual meeting.

This resolution, being voted upon, was unanimously adopted.

The literary program was then resumed.

The next paper on the program, postponed from the previous session by permission of the Association, "The Vaccination of Porto Rico, a Lesson to the World," by Major Azel Ames, U.S.V., was then read.

The next paper, "Typhoid and Malarial Fevers at Chickamauga," by Major E. C. Carter, Surg., U.S.A., was read.

Lieut. Col. VALERY HAVARD, U.S.A.: Dr. Nimier, the distinguished delegate of France, has requested me to present in his name a short paper entitled "A Note upon the Pathological Anatomy of Cerebral Compression."

Upon motion of Col. Havard the paper, after translation, was ordered to be turned over to the Publication Committee, and the thanks of the Association extended through Col. Havard, to Col. Nimier, for his paper.

Dr. S. C. STANTON, Contract Surgeon, U.S.A.: I received a telegram from Col. Adams of Illinois yesterday and some literature this morning regarding the International Olympian Games to be held in Chicago in 1904, together with a copy of a letter from the President of the United States endorsing the games and copies of resolutions passed by other societies. It appears that at the games there is to be a department of military service, including the physical development of the soldier, preservation of health, prevention of disease, sanitation of camps, etc., and he asked me that a resolution be presented to this Association endorsing the games; and if it be your pleasure I will present such a resolution:

Whereas, the United States having been selected by a congress of delegates representing the nations of the world as the site for the Quadrennial International Olympian Games in 1904, which are to take place in the city of Chicago, Illinois; and

Whereas, it is proposed at that time to have an interchange of opinion and reports of facts on the physical aspects of military service, including the physical development of the soldier, the preservation of health, the prevention of disease, sanitation of barracks, camps, etc., Now, therefore,

Be it Resolved, that the Association of Military Surgeons of the United States pledges its support and cooperation in the Olympian Games of 1904.

Upon motion of Dr. Stanton, this resolution was referred to the Executive Committee, with power to act.

The literary program was resumed by the reading of a paper entitled "The Treatment of Yellow Fever, Past and Present," by Dr. James Carroll, U.S.A.

Major W. C. BORDEN, U.S.A.: I ask the indulgence of the Association for a moment in order to introduce a motion. I move that a committee of five on legislation relative to the act of incorporation of our Association to confer with the President of the Association and the Executive Committee and act with them to promote the passage of the act of incorporation, be appointed by the President of the Association.

I wish to say to the Society that the Secretary of War has been called upon to-day, as well as the Secretary of the Navy, and they have both approved the act of incorporation and have stated that they would do what they could to favor its passage. The Secretary of the Treasury has not yet been heard from.

This motion being duly seconded was unanimously carried.

The President appointed as members of the committee the following:

Lieut. Col. J. Van R. Hoff, U.S.A., Chairman;
Lieut. Col. O. H. Marion, M.V.M.;
Medical Director R. A. Marmion, U.S.N.;
Surgeon General Walter Wyman, U.S.M.H.S.;
Major W. C. Borden, U.S.A.

The Secretary Major JAMES EVELYN PILCHER, U.S.A., then presented the invitation of Major and Mrs. LaGarde requesting the pleasure of the company of the President, officers and members of the Association and their ladies at their residence at the Soldiers' Home, Washington, between the hours of two and six o'clock, to-morrow, Sunday, afternoon, to meet Colonel Nimier of the French Army.

The PRESIDENT: One of the few disappointments of this meeting to me lies in the fact that we were obliged through stress of work to give up Major and Mrs. La Garde's reception which was scheduled for this afternoon.

Major T. C. CLARK, Minn., submitted through the Secretary the following resolution:

Whereas, Brigadier General George M. Sternberg, U.S.A. is to be retired by reason of age on the 8th instant; and

Whereas, General Sternberg has conferred honor upon his country, the medical profession, and this Association by the illustrious services which he has rendered in the interest of science and in the administration of his office during the trying period of the war with Spain and the hostilities in the Philippines: Therefore, be it—

Resolved, that this Association desires to testify to the appreciation it has of the invaluable services rendered his country by General Sternberg and the high esteem in which it holds his scientific and professional attainments and of the indebtedness of his country to him for his services in both peace and war during his professional and military career; and

Resolved, that we feel that such services entitle him to the grateful recognition of his country, and that nothing more than a just appreciation would be indicated by his retirement as a Major General.

This resolution being duly seconded was unanimously adopted.

The literary program was then resumed, the first paper read being that of Major Louis L. Seaman, late Surg. U.S. Vol. Engs., "The Army Cartridge Belt," a filled cartridge belt being used to illustrate the points of the paper.

The next paper on the program, "The Pathology of Chronic Specific Dysentery of Tropical Origin," by Dr. Charles F. Craig, U.S.A., was read by title.

The next paper, "Observations on the Plague in the Philippines and India," by Major Charles B. Ewing, Surg., U.S.A., was read by title.

The following papers were read by title:

"Tuberculosis in the tropics," by Capt. J. J. Curry, late Asst. Surg., U.S.V.

"Typhoid Fever in the Tropics," by Major T. C. Biddle, late Surg. 21st Kans. Vols.

"The Work of the U.S. Army Medical Department in China," by Major Francis J. Ives, Surg. U.S.A.

"The Kahuna or Witch Doctor of Hawaii," by Major Blair D. Taylor, Surg. U.S.A.

"Gunshot Wounds of the Shoulder and Knee Joints," by Col. Geo. R. Fowler, Div. Surg. N.G.N.Y.

"Major Operations at the New York Naval Hospital, Brooklyn, N. Y., in 1901," by Surg. George Rothganger,, U.S.N.

"Volvulus in its Relation to Hernia," by Surg. G. T. Vaughan, U.S.M.H.S.

"A further Consideration of the Necessity for immediate Celiotomy in Penetrating Gunshot Wounds of the Abdomen in War," by Capt. C. E. B. Flagg, Asst. Surg. U.S.A.

"Wounds of Nerves," by Capt. James S. Warbasse, Asst. Surg. N.G.N.Y.

"Practical Application of Radiography in Military Surgery at Field Hospitals," by Major W.C. Borden, U.S.A.

"Bolo Wounds," by Lieut. C. De W. Brownell, Passed Asst. Surg., U.S.N.

"Cases of Bolo Wounds", by Capt. Henry C. Fisher, Asst. Surg., U.S.A.

"Some Experiences with Bolo Wounds," by 1st Lieut. Jere B. Clayton, Asst. Surg., U.S.A.

"The Laws of Ballistics and Physics, the true explanation of the lodgment and deflection of modern small arm projectiles, not the Ricochet Hypothesis," by Major C. B. Nancrede, late Chief Surgeon, U.S.V.

"Secondary Hemorrhage," by Major Arthur L. Wright, Surg., N.G.Iowa.

"The Medical Department of the U. S. Transport Service," by Major H. S. Kilbourne, Surg., U.S.A.

"Hospitals and Charities in Cuba," by Major J. R. Kean, Surg., U.S.A.

"The Japanese Red Cross Society and Red Cross Nurses," by Col. N. Senn, Surg. Gen. of Ill.

"The Training of Hospital Corps Men", by Capt F. A. Winter, Asst. Surg., U.S.A.

The next paper to be read was that entitled "The Nurse Corps of the Army," by Dr. Anita Newcomb McGee, late Supt. Nurse Corps, U.S.A., which was discussed by Col. EXHAM, R.A.M.C., Capt. MYLES STANDISH, M.V.M., Lieut. Col. VALERY HAVARD, U.S.A., Lieut. Col. J. K. WEAVER, Pa., and the PRESIDENT.

On motion of Medical Director J. C. Wise, U.S.N., an adjournment was taken until 2:00 P. M.

SEVENTH SESSION, SATURDAY AFTERNOON, JUNE 7, 1902.

The President called the meeting to order at two o'clock.

The literary program was taken up, the first paper being "A New Device for a First-Aid Packet," by Asst. Surgeon, J. C. Thompson, U.S.N., which was read by Surgeon F. W. F. Wieber, U.S.N. A sample packet was shown and explained to the Association.

"Remarks Suggested by Three Years' Service in Cuba," by Capt. J. H. Stone, Asst. Surg., U.S.A., were then read.

The next paper on the program, "Military Hospitals and Nursing," by Major Matt R. Root, Surg. N.G. Colo., was read by title, as were also the following:

"The Relation of Personnel to Bed Capacity in Military Hospitals," by Capt. John S. Kulp, Asst. Surg. U.S.A.

"How can Medical Officers promote expert Marksmanship in the Army," by Gen. J. Francis Calef, Surg. Gen. of Conn., retired.

"Traumatic Rupture of the Choroid," by 1st Lieut. Edward Stieren, Asst. Surg. N.G.Pa.

"Favus and its Treatment," by Passed Asst. Surg. S. G. Evans, U.S.N.

The President then introduced Lieut. Col. Z. R. Molina, delegate from the Mexican Army, who read his paper, "Practical Notes on Clinical Therapeutics in the Treatment of Venereal Manifestations among the Soldiers of the Garrison of Vera Cruz."

The PRESIDENT: I am sure that we are all under great obligations to Col. Molina for his very interesting paper on the treatment of cases which I do not think are entirely confined to military bodies, but which are somewhat prevalent in such bodies, and I think it right that the Society should express by a vote of thanks its appreciation of Col. Molina's paper and of his presence.

On motion of Medical Director J. C. Wise, U.S.N., a vote of thanks was unanimously tendered Col. Molina.

The following papers were then read by title and referred to the Publication Committee:

"Organization and Conduct of a Medical Supply Depot," by Col. J. Morris Brown, Assistant Surgeon General, U.S.A.

1. "Abscess of the Liver." 2. "Malignant Diseases, as observed at the U.S. Army General Hospital, Presidio, California," by Lieutenant-Colonel A. C. Girard, Deputy Surgeon General, U. S. Army, Commanding Hospital.

"Gonorrhea from the standpoint of the Naval Surgeon," by Passed Asst. Surg., S. G. Evans, U.S.N.

"Some of the more important Considerations Governing the action of the Board recently appointed to revise the Supply Table of the Medical Department, U. S. Army," by Capt. E. L. Munson, Asst. Surg., U.S.A.

"The Medical and Surgical Equipment for a Regiment for a week's tour of duty," by Lieut. Col. J. K. Weaver, Chief Surg. N.G.Pa.

"A New Medical and Surgical Case, a substitute for the Hospital Corps Pouch," by Major F. W. Hendley, Surgeon Ohio N.G.

"Expansion of the Hospital Corps in War," by Major G. E. Bushnell, Surgeon, U.S. Army.

The next paper, "The Military Motor Ambulance," by 1st Lieut. Clyde S. Ford, Asst. Surg. U.S.A., was read by the author.

Major Louis A. La Garde, Surg. U.S.A., then delivered his "Remarks on the effects of the Luger and Colts Automatic Pistols," illustrated by a number of well executed skiagraphs.

The SECRETARY then presented a special report from the Executive Committee: The Executive Committee recommends to the Association the following resolution:

Resolved, That not to exceed \$500 be allowed to the Committee of Arrangements for necessary expenses not connected with the local entertainment.

On motion of Major A. H. Briggs, N. Y., the resolution was adopted.

The literary program was then resumed, the next paper

"Organic Stricture of the Urethra," by Surg. Henry W. Sawtelle, U.S.M.H.S., being read by title.

The next paper to be read was that on "A New Field and Navy Litter," by Lieut. C. Alexander Crawford, U.S.N. A litter of the kind described was exhibited and its manner of operation explained.

A paper on "Army Water Supply," by Mr. P. A. Maignen, of Philadelphia, was read in summary form by its author.

The PRESIDENT: I think I express the views of the Association when I say to Mr. Maignen that we are very much obliged to him for his remarks and for the exposition of his methods of purifying water as shown in his exhibit.

The PRESIDENT then announced the conclusion of the literary program, and that the next order of business was the election of officers.

On motion of Major A. H. BRIGGS, N. Y., the Secretary was instructed to cast the ballot of the Association for the officers named in the report of the Nominating Committee.

The SECRETARY then reported the ballot cast, as follows:

For President, Gen. Robert A. Blood, M.V.M.;

First Vice-President, Med. Director J. C. Wise, U.S.N.;

Second Vice-President, Surg. Gen. Walter Wyman, U.S.M.H.S.;

Secretary, Major James Evelyn Pilcher, U.S.A.;

Treasurer, Lieut. Herbert A. Arnold, N.G.Pa.

The PRESIDENT: It is understood that under the provisions of the Constitution as amended by the adoption of the report of the Executive Committee, the Secretary from this time forth is a permanent officer of the Association.

I desire to announce to the Association that Gen. R. A. Blood of Massachusetts has been elected President; Captain J. C. Wise, Medical Director, U.S.N., First Vice President; General Walter Wyman Supervising Surgeon General, U.S.M.H.S., Second Vice-President; Major James Evelyn Pilcher, U.S.A., Secretary; and Lieut. Herbert A. Arnold, N.G.Pa., Treasurer. General Blood will please assume the chair.

Lieut. Col. JOHN VAN RENSSELAER HOFF, the retiring President, then addressed the new President as follows:

General Blood, I congratulate you on your election to a

very important office, and I can assure you that I do it with the greatest personal pleasure because I know that for years you have engaged in the work of the Association mightily. I well remember quite a number of years ago—it seems to me a great many—while talking with a dear old friend of ours from Massachusetts—Forster—remarking, “General, what kind of a man is Colonel Blood?” He turned around to me and said “He is quiet, but he is all gold.” And this is our new President. (Great applause.)

General BLOOD: Gentlemen of this Association, I have only a word to say, and that word is to thank you for this great honor you have conferred upon me in electing me President of this Association. I feel a great responsibility and I appreciate the great honor. It is the greatest honor that ever came to me, and I thank you for it. I shall serve you to the best of my ability, but a President to carry on the work that is required of him needs the assistance, to keep this Society up to the standard of the past, of every man in the Association, and I trust that I shall have that assistance. It is a hard place to fill,—following the men that have preceded me. I know the conditions and, as I said before, I shall do my best to make the incoming administration a success. I trust you all understand that the invitation to come to Boston is an honest one and that if you come we shall try to make your stay there pleasant and give you all the opportunity possible for a successful meeting. I thank you. (Great applause.)

On motion of Major A. H. BRIGGS, N. Y., the Secretary was authorized to cast the ballot of the Association for BOSTON, as the next place of meeting, in compliance with the report of the Nominating Committee.

The SECRETARY: I have the honor to report that the ballot has been cast for Boston as the next place of meeting of the Association.

Major A. H. BRIGGS: I believe, Mr. President, it is understood that the date is to be fixed by the Executive Committee, after consultation with the local committee of arrangements. Am I correct?

Passed Asst. Surg. C. P. WERTENBAKER, M.H.S.: I think that is correct. That is the understanding of the Nominating Committee—that the date was to be left with the Executive Committee, after consultation with the local committee.

Lieut. Col. JOHN VAN R. HOFF, U.S.A.: I hesitate to address the chair, but it seems to me that there are a number of resolutions that it is customary to pass at this stage of the meeting; and I will begin them by submitting a resolution of thanks and appreciation on the part of the Association to the President of the United States for his presence at the opening exercises of this meeting and for the admirable address which he delivered on that occasion.

A vote being taken on this resolution it was unanimously adopted.

Medical Inspector S. H. DICKSON, U.S.N.: I move that the thanks of the Association be tendered to our retiring President, who during the past year has served the Association so faithfully, so well, and so ably, that our membership has been increased, and our Association placed on a standing of which each member should be individually proud.

This motion was numerously seconded and unanimously carried.

On motion of Lieut. Col. VALERY HAVARD, U.S.A., a vote of thanks was also unanimously extended to the Secretary and to the Treasurer for the fidelity with which they had conducted their respective offices.

Passed Asst. Surg. C. P. WERTENBAKER, U.S.M.H.S.: Mr. President, I move that the thanks of this Association be returned to Major Geo. Henderson, chairman of the Committee of Arrangements, and to all other members of local committees which had charge of this entertainment; to Gen. Chas. Heywood commanding the Marine Corps for the services of his band; to the President of the Board of Commissioners of the District of Columbia for the welcome extended on behalf of the government of the District; to the President of the Medical Society of the District of Columbia for the welcome tendered on behalf of the medical profession; to Major W. C.

Borden and Captain Frederick P. Reynolds, for the superb demonstration of Hospital Corps work at Washington Barracks; to the Honorable Secretary of the Navy and the officers of the Dolphin for the courtesies extended to the Association on that vessel; to the exhibitors of medico-military supplies, many of whom have brought their exhibits to us at large expense; also to the proprietors of the New Willard, and to all other persons, individually and collectively, who have contributed to our entertainment. We have enjoyed the meeting here to the fullest extent and we leave with full gratitude to them all.

Lieut. Col. JOHN VAN R. HOFF, U.S.A.: In seconding the motion I wish to bear witness to the fact that Major Henderson has devoted many days of utmost effort in the perfecting of the arrangements for this meeting. It has been no easy undertaking, and I am sure that he and his committee and every member of that committee have worked hard and are entitled to the hearty and appreciative thanks of this Association.

The motion was unanimously carried.

Col. RICHARD EXHAM, R.A.M.C.: I wish to thank you all for the great kindness and courtesy you have shown me on this interesting visit. The high class of work done here, the high class of papers which have been read, have shown that very earnest work has been done by your members, and has been a lesson to me. It has given me the hope that we in the British Army will institute a similar association and endeavor to follow your example. (Applause.)

There being no further business to come before the Association, on motion of Lieut. Col. JOHN VAN R. HOFF, U.S.A., the eleventh annual meeting of the Association of Military Surgeons of the United States adjourned.

The Opening Session.

THE CHAIRMAN (Major George Henderson, Surgeon General of the District of Columbia Militia): Ladies and gentlemen, the hour having arrived to open the eleventh annual meeting of the Association of Military Surgeons of the United States, the house will please come to order. You will listen to an invocation for the Divine blessing to rest upon our work, by the Right Rev. Henry Y. Satterlee, Bishop of Washington.

INVOCATION.

BY THE RIGHT REV. HENRY Y. SATTERLEE, D.D.
BISHOP OF WASHINGTON.

LET US PRAY. Our Father which art in heaven, Hallowed be thy name, Thy kingdom come. Thy will be done in earth, as it is in heaven. Give us this day our daily bread. And forgive us our debts, as we forgive our debtors. And lead us not into temptation, but deliver us from evil: For thine is the kingdom, and the power, and the glory, for ever, Amen.

O Lord, our Heavenly Father, the high and mighty ruler of the universe, who dost behold all the dwellers upon earth, most heartily we beseech Thee with Thy favor to behold and bless Thy servant the President of the United States and all the members of Congress, and those in authority, and so replenish them with the grace of Thy Holy Spirit, that they may always incline to Thy Will and walk in Thy Way. Endue them plenteously with heavenly gifts. Grant them in health and prosperity long to live, and finally after this life to attain everlasting joy and felicity, through Jesus Christ our Lord.

Most gracious God, we humbly beseech Thee as for the people of this United States in general, so specially for the

Armies and Navies of our country, that Thou wouldest be pleased to direct and prosper all their efforts to the advancement of Thy glory, the safety, honor, and welfare of Thy people, that all things may be so ordered and settled by their endeavors upon the best and surest foundations, that peace and happiness, truth and justice, religion and piety, may be established among us, for all generations. These, and all other necessaries for them, for us, and the whole nation, we humbly beg in the name and through the mediation of Jesus Christ our most blessed Lord and Savior.

O God, forasmuch as without Thee, we are not able to please Thee, we beseech Thee mercifully to grant Thy blessing upon this Association of Military Surgeons, who are met here this day, and grant then, that all their works being begun, continued and ended in Thee, our country through their endeavors and their deliberations may be blessed and that this Association may be furthered with Thy help; through Jesus Christ, our Lord.

The grace of our Lord Jesus Christ and the love of God and the fellowship of the Holy Ghost be with us all, evermore. Amen.

THE CHAIRMAN: Gentlemen of the Association: The President has graciously honored us by his presence and will open our Eleventh Annual Meeting. Ladies and gentlemen, the President of the United States. (Tremendous applause, the audience rising.)



Right Rev. Henry Y. Satterlee, D.D.

OPENING ADDRESS.

BY THE HONORABLE THEODORE ROOSEVELT, LL.D.
PRESIDENT OF THE UNITED STATES.

I AM GLAD to have the opportunity to bid welcome to the members of this Association and their friends to-day.

The men of this Association combine two professions, each of which is rightfully held in high honor by all capable of appreciating the real work of men—the profession of the soldier and the profession of the doctor. Conditions in modern civilization tend more and more to make the average life of the community one of great softness, of great ease, compared to what has been the case in the past, and, Gentlemen, together with all the advantages that have come from this softening of life, this rendering it more easy, there are certain attendant disadvantages also. It is a very necessary thing that there should be some professions, some trades, where the same demands are made now, as ever in the past, upon the heroic qualities in a man, and those demands are made alike upon the soldier and upon the doctor; and how much more upon those who are both soldiers and doctors—upon the men who have continually to face all the responsibility and all the risk faced by their brothers in the civilian branch of the profession, and who also in time of war must face the same risks, often exactly the same risks, that are faced by their brothers in arms whose training is to kill and not to cure. (Applause.)

It has been my good fortune, Gentlemen, to see some of your body at work in the field; to see them carrying the wounded and the dying from the firing line, themselves as much exposed to danger as those they were rescuing, and to see them working day and night in the field hospitals afterward, when even the intensity of the strain could hardly keep them awake, so fagged out were they by having each to do the work of ten. (Applause.)

I welcome you here. I am glad to have the chance of seeing you, and I wish to say a word of congratulation to you upon this Association. In all our modern life we have found

it absolutely indispensable to supplement the work of the individual by the work of individuals gathered into an association. Without this work of the Association you cannot give the highest expression to individual endeavor, and it would be a great misfortune if the military members of the surgical and medical professions did not take every advantage of their opportunities in the same way that it is taken by the members of the medical and surgical professions who are not in the army or the navy or the marine hospital service, but who are in civil life outside.

I am glad to see you gathered in this Association; and just one word of warning: Pay all possible heed to the scientific side of your work, perfect yourselves as scientific men, able to work with the best and most delicate apparatus,—but never for one moment forget, especially the higher officers among you, that in time of need you will have to do your work with the scantiest possible apparatus (applause) and that then your usefulness will be proportioned not upon the adequacy of the complaint that you didn't have apparatus enough, but upon the way you have done with what you have. (Applause.) Remember that, and remember, also,—and this especially applies to the higher officers—that you have got to supplement in your calling the work of the surgeon with the work of the administrator. You have got to be doctors and military men and able administrators. I thank you. (Loud and prolonged applause.)



The Honorable Theodore Roosevelt,
President of the United States.

THE CHAIRMAN:—I take great pleasure in introducing to you, the Honorable Henry B. F. Macfarland, President of the Board of Commissioners of the District of Columbia, who will address you words of welcome on the part of the citizens of the District of Columbia.

THE DISTRICT OF COLUMBIA.

BY THE HONORABLE HENRY B. F. MACFARLAND.

PRESIDENT OF THE BOARD OF COMMISSIONERS OF THE DISTRICT OF COLUMBIA.

THE GOVERNMENT and the people of the District of Columbia welcome your association most heartily to the national capital. We are glad you are here at its most beautiful season. We know that you are proud of its beauty and desire to see it even more beautiful, for you have the common interest in it of all the citizens of the United States, who feel that nothing is too good for the national capital. The new old principles development of the District of Columbia have the support of all intelligent and patriotic Americans who have examined them.

A visit to Washington just pride of now exalts the while it improves any American spires him to improvement capital which and goodly all. It is now political, and in some sense the social, but also the scientific, capital of the United States. Here are the headquarters of the army and navy, the marine hospital service and all the



Honorable Henry B. F. Macfarland.

scientific departments of the national government. This is the center of such work as you represent. You have double reason for feeling at home here. We hope that you will feel so.

We recognize that you represent the soldiers of health, the forces that save from the soldiers of death. We see in your achievements on the battlefield and in the fields of epidemics the altruism and the heroism which are the chief distinctions of men. We hold you in honor for all that is humane, heroic and philanthropic in your labors. We are very glad that distinguished men are here to represent other countries in your convention, and we trust that they may feel thoroughly welcome. We hope that you will perfect an international organization, and that you will meet, if not annually, at least every other year in the capital of the United States, which is destined, we believe, to be the moral, intellectual and spiritual center of the world. (Applause.)

THE CHAIRMAN.—The next introduction will be of an honored member of our beloved profession, Dr. S. S. Adams, President of the Medical Society of the District of Columbia, who will address you words of welcome on behalf of that society.

THE MEDICAL PROFESSION OF THE DISTRICT OF COLUMBIA.

BY SAMUEL S. ADAMS, M.D.

PRESIDENT OF THE DISTRICT OF COLUMBIA MEDICAL SOCIETY.

ON BEHALF of the Medical Society of the District of Columbia I bid you welcome and extend to you her best wishes for your success. Our society may rightly be called your grandmother, since several of her sons and founders were surgeons in the army and navy of the United States. She has lived a life of usefulness for four score years, but still retains the vigor infused into her in her infancy. Although she has reached such a ripe old age, and has passed through several critical illnesses, nevertheless her strength is sufficient to secure from Congress better drinking water for our citizens, as well as to defeat legislation intended to hamper

progressive scientific medicine under the guise of prohibiting vivisection upon the lower animals. (Applause.)

Her sons in response to the call of duty, served with distinction in the Mexican war, the Crimean war, the war of the Rebellion, the Franco-Prussian war, the Spanish-American war, the siege of Pekin and the Boer war. Some lost their lives in the line of duty, others made scientific discoveries during perilous exposure to shot and disease, and still more are now striving to perfect the highest aim of our science—the prevention of disease.

Has our grateful country erected a monument to any one



Dr. S. S. Adams.

ing the scientific achievements of our friends, we are to-day witnessing the spectacle of congressional indecision in conferring a merited honor upon one whose acts have always redounded to the credit of his country and to himself.

Indeed, if the Medical Society of the District of Columbia could influence Congress today as successfully as she did when better water and purer food were demanded, the sci-

tific attainments, the professional labors, the unselfish devotion to duty, the modest demeanor and the high personal character of her son and your brother would be recognized by rechristening him Major General George M. Sternberg, U.S.A. (Great applause.)

In some of the New England states "old home week" has been successfully inaugurated. At this time the old and young in distant states return to their homes and unite with their friends and relatives in recalling their childhood days and in rejoicing over the prosperity of their manhood. On such occasions the old family physician greets, with much pride, his young professional brother, who, perchance, has already attained an eminent position in his adopted city. There are here no professional jealousies, no scientific bickerings, but fraternal felicitations, sincere well wishes and an earnest plea for the guest's return.

The Medical Society of the District of Columbia adopts this beautiful New England custom. She joins with you in fraternal felicitations, urges you to renew your visit and will always be proud of your noble work. (Great applause.)

THE CHAIRMAN:—Beginning at 1 o'clock this afternoon and continuing until 3:30, there will be a business meeting in the convention hall at the New Willard Hotel. From 4:30 to 6:30, there will be a Hospital Corps drill exhibition at Washington Barracks and a lunch will be served on the grounds. This evening at 8 o'clock, at the Hall will be a business meeting.

I would say to the members of the Association who have not registered, that you will oblige us if you will go directly after this meeting to the Washington Light Infantry Armory, only half a square away from the New Willard Hotel, where you will find the Committee on Registration and Transportation.

Colonel Hoff [addressing the President of the Association], on behalf of the Committee of Arrangements, I hand you the program of this, your eleventh annual meeting.

Ladies and gentlemen [turning again to the audience], I have the honor of introducing to you our President, Lieutenant Colonel John Van Rensselaer Hoff, United States Army. (Great applause.)

The President's Annual Address.

THE BROADER MISSION OF OUR ASSOCIATION.

By LIEUTENANT COLONEL JOHN VAN RENSSELAER HOFF.

DEPUTY SURGEON GENERAL IN THE UNITED STATES ARMY;
PRESIDENT OF THE ASSOCIATION.

MR. CHAIRMAN, FELLOW MEMBERS, DELEGATES, LADIES AND GENTLEMEN:

TO HAVE BEEN elected President of the Association of Military Surgeons of the United States in succession to a Senn, a Sternberg, a Gihon, is indeed an honor. I can not aspire to fill full the chair occupied by such distinguished predecessors, yet may I not hope that out of their over-abundance, through your kind consideration, something may be added to my account?

Since our last assembly, "taps" have sounded for fifteen of our comrades, and the "lights are out."

Following the custom of the Association, invitations to be represented at this meeting were sent to the three national medical services, the medical departments of each of our state forces, Canada, and through our State Department, to those of the foreign nations with whom we have military attachés.

I take pleasure in extending to the delegates from home and abroad who have honored us by their presence a fraternal welcome. I say fraternal, for are not all medical officers of whatever nation members of a brotherhood whose symbol is the red cross now quartering the flag of every nation?

Thanks to the generosity of the founder of the Enno Sander Prize, there being no competition in 1901, the value of the prize this year was doubled, making it \$100.00 in gold and a gold medal of equal value. Five competitors presented essays on the designated subject,—"The Most Practicable Organization for the Medical Department of the United States Army

in Active Service," which were submitted to a board of distinguished officers, consisting of Major General Wesley Merritt, Brigadier General John Moore and Brigadier General George M. Sternberg, Surgeon General, all of the Army. A resumé of the successful essay and discussion thereon, will open the literary program of this meeting.

The literary and fiscal history of the Association for the current year will be set forth in detail in the valuable reports of your Secretary and Treasurer.

During the year 280 new names have been added to our list making a total membership of 770 which is still continuously and rapidly increasing. (Applause.)

Under the broadening lines of our Constitution the *clientèle* from which our membership can be drawn has been immensely increased, and it behooves each one of us to remember that the influence of the Association is directly proportionate to its strength.

The balance reported by the Treasurer this year is \$4253.26, against which there may be said to be no appreciable outstanding indebtedness. (Applause.) The increasing resources and responsibilities of the Association, as well as other reasons, appear to make it desirable that we should seek a charter from Congress, a plan for which will presently be laid before you.

For the admirable arrangements for this meeting, the results of which you see, but the efforts to produce which you can have no knowledge of, the Association is under the greatest obligation to the Committee of Arrangements. To say



Lieut. Col. John Van R. Hoff, U.S.A.
President.

that Major Henderson is Chairman of this Committee is to guarantee that everything that can be, has been, done to make our meeting of 1902 an unqualified success. (Applause.)

With approval of our Executive Committee, based upon the accepted report of the Committee on Journal, 1901, it was determined to issue the transactions of 1901 in fasciculi. These fasciculi took the form of a *Journal of the Association of Military Surgeons of the United States*, which has appeared quarterly during the year. In a word, the long hoped for and much talked of *Journal* has come, and, I hope, has conquered. If not, it has at least widely extended the literary reputation of the Association at no cost except the devoted and unceasing efforts of our able Secretary, Major Pilcher, who has spared himself nothing that success might crown the undertaking. (Applause.)

This year our program is loaded with rich literary fruits, for the cultivation of which the indefatigable Chairman of the Literary Committee, Colonel Alden is entitled to the thanks of the Association. Shall they be preserved in an annual volume, or shall they be served to our members in all their freshness in a vigorous periodical which shall be known to the world as "*The Journal of the Association of Military Surgeons*?" Such a Journal, coming to us regularly, would be a constant reminder of our organization, and what it means.

But what *does* it mean? The preamble to the Constitution states the object of the Association to be the "promotion and improvement of the science of Military Surgery." In the first presidential address, 1892, the distinguished founder, General Senn, outlined the mission of the Association somewhat as follows:

Concerted action, a union of all the state medical services in a central association, to which should be presented reports of the work of minor supporting organizations, and from which should emanate the inspiration to further work. Organization everywhere on identical lines, so that in whatever position a medical officer might find himself, his surroundings would not be altogether unfamiliar, and that he

might at least be able to understand official language and methods. A Medical Corps in the National Guard of every State, organized on the lines of the regular establishments, similarly uniformed and equipped—not an aggregation of physicians attached to regiments, wearing the uniform of the regiment, and having no interest outside the particular organization to which they belong. Original research in the many problems of military sanitation; and finally, the establishment of a public military medical school.

In 1893 officers of the public medical services were admitted to active membership.

Ten years have elapsed since this address was delivered, during which, for a short period, almost the entire national guard was mustered into the volunteer army, and we had an opportunity of practically testing, largely from a negative standpoint, the value of the admirable advice which our distinguished President that day vouchsafed.

Improvement in the public services is a plant of slow growth, but during the six years of our existence before the occurrence of the Spanish-American war, there had been a distinct advance, a faithful record of which is written in our then six volumes of transactions,—an unparalleled production.

Unfortunately the Association and its work were known to but a small percentage of those who assumed the responsibilities of medical officers in that war. But even under those most adverse circumstances it justified its existence by helping to leaven with its 150 members who entered the service, the loaf of excellent, but raw, medico-military material which was then assembled.

Our record in peace and war, though covering but a single decennium, is rich in accomplishment, and should the Association even now cease to exist, it would not have lived in vain. But there is no threat of dissolution; on the contrary we are stronger to-day than ever, and a future of the greatest usefulness opens before us. Let us not forget, however, that opportunity demands effort, and our success will be directly proportionate to the amount of work we are willing to invest.

To-day the attention of our legislators is being directed

towards the nationalizing of our state forces. Are the Medical Departments of these ready to assimilate? Have they reached the standard set for them by our honored founder in his memorable address? Some of our State guards have medical departments that leave little to be desired,—but how many?

I find by reference to the latest returns that the organized militia numbers 115,749, of which 902 pertain to the medical department, including hospital and ambulance corps,—about eight-tenths of one per cent, less than one-half of what it should be for the most advanced line of assistance, leaving entirely out of consideration everything from there back to the base hospital, all of which would require not less than six times the total number of men now in the medical departments of the state forces. Are the medical departments of all states organized on identical lines? Are their medical officers members of a distinct corps? Or do they in some states yet linger, superfluous appendages to the regimental commander, to be made or broken at his whim? And as to equipment—is that uniform? Instruction,—is that the same? Requisitions, reports, returns, regulations,—do they correspond?

Turning to the regular establishments, the Association here also has a mission. It must demand of their personnel, both commissioned and enlisted, the highest degree of efficiency; it must see that their organization and equipment are as perfect, if not more perfect, than those of any other nation; it must provide a means, through our medical schools, for the dissemination of a knowledge of military sanitation in the profession at large, so that every physician will know something of the work of the medical officer.

One of its most important duties is to see that a public medical school is established in which shall be educated those who are to become members of the three public medical services. Such a school should be organized in this city in connection with a great military hospital. To it should be nominated medical cadets exactly as are cadets to West Point or Annapolis. Here the enlisted force for the Hospital Corps should receive preliminary training for their important duties. In connection with the hospital should be a training

school for women nurses for duty at fixed hospitals, and here special courses could be arranged for medical officers of the National Guard. What a wonderful influence for good would such an institution develop.

And last, but not least, the Association must formulate plans by which private aid may be made to supplement, not supercede, the public services in time of war or other stress. (Applause.) But beyond these things, important as they are, the Association offers to the military humanitarians of the world an opportunity to meet on common ground and co-operate in formulating methods for the mitigation of what must always be "the horrors of war." We see the beginning of this today in the presence of distinguished representatives of the medical departments of foreign armies, gathered from all quarters of the globe, and may we not hope that through them and their successors the good influences of this Association will be extended to the uttermost parts of the earth? (Applause.)

Originated by civil practitioners to improve the efficiency of the medical departments of the state forces, year by year the Association has broadened its lines until it embraces in its membership not only the medical officers—past and present—of the national guard and volunteers, but of the army, the navy and the marine hospital service as well. Even more, our doors are now opened to the medical officers of the armies of all nations.

With such a mission to accomplish, it is not seemly that our members should put aside their responsibilities at the close of one meeting and as lightly assume them at the next, if they should chance to attend. The work must be constant, through committees organized to do, not to forget, the membership of which should be willing to work and the chairman to report. The Association should be kept in touch with its members and the world through the instrumentality of its journal, filled with valuable matter not elsewhere easily obtained, which would be a constant reminder and inspiration to work as well as a powerful means of educating the public.

This, gentlemen, is the broader mission of our Association. Will you undertake it? (Great applause.)

Medico-Military Index.

MEDICO-MILITARY ADMINISTRATION.

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Editorial Department.

THE ELEVENTH ANNUAL MEETING.

THAT success crowned the eleventh annual meeting goes without saying. The opening session with the exceedingly appreciative address of the President of the United States and the strong and suggestive annual address of the President of the Association were all that could be desired, and did much to fix the authoritative position of the Association in the public estimation. Of the scientific phase of the convention much might be said, but the publication of the minutes of the meeting in full to be followed through the year by the papers in detail will fully demonstrate the rich program which was so bountifully laid before the members in attendance.

A point, which it is hoped will be corrected at the next meeting, was the amount of time consumed in reading some of the papers. A limitation to twenty minutes,—except perhaps in one or two papers of special importance where the literary or program committee has allowed extension—can advantageously be placed upon the time allowed to readers of papers. This limitation is by no means a reflection upon the importance or value of the papers submitted, but is necessitated rather by (1) the inability of an audience to assimilate and ap-



Badge of the Eleventh Annual Meeting.

preciate a longer paper, and (2) the demand for time upon the part of other contributors equally entitled to be heard,—not to speak of (3) the high desirability of time for discussion. There is much detail in every comprehensive paper, which really distracts attention from the author's line of thought, when read; this can with great advantage be omitted from the reading, and presented in full in the published memoir. It was the cause of much regret also, that on account of the *embarras des richesses*, a number of exceedingly valuable and important papers were submitted by their authors to be read by title. These will be made accessible, however, in early numbers of the JOURNAL.

A number of notable legislative actions were taken during the meeting, conspicuously among which were the approval of the JOURNAL and its future monthly issue, the reduction of the annual dues, beginning with 1903, to \$3.00 a year, the opening of associate membership to medical officers of foreign services, and the inauguration of a movement to have the Association incorporated by act of Congress. The details concerning the first three points will be given in the report of the Executive Committee to be published next month. It is much to be regretted that the early adjournment of Congress precluded the consummation of the incorporation during the late session of that body; it will be taken up, however, early in the next session and promptly brought to a successful issue.

Important practical phases of medico-military work were taken up at the exhibition drill of the Hospital Corps Company of Instruction at Washington Barracks. The practical exposition of hospital service,—including drill movements, first aid exercises, the extempore preparation of diet for the sick and injured, and the pitching and arrangement of the field hospital,—were of the greatest interest. The medico-military exhibit in the armory of the Washington Light Infantry was also of much value to the members present. The chronological exhibition of the regimental field hospital equipment from the War of the Rebellion to the present day,—prepared under

the direct supervision of Colonel Hoff,—was interesting and instructive in the extreme. To comment upon the special displays of the business houses represented in the exhibit would be invidious,—these gentlemen realize that the only way of reaching the attention of the vast majority of the Association is through the commercial announcements of the JOURNAL and most of them avail themselves of the facilities offered, so freely that the members of the Association are kept constantly informed upon these lines, notwithstanding inability to attend the annual meetings.

Among the most beneficial features of the annual meetings is the opportunity for personal contact and mutual acquaintance afforded by them. Not the least of the accomplishments of the Association of Military Surgeons of the United States is the combination into sympathetic mutual organization of the several national and state medico-military services, formerly independent and mutually repellent if not actually antagonistic. Nothing could contribute more effectually to this end than the social commingling afforded by functions such as the excursion down the Potomac on the "Dolphin," the President's despatch boat, gracefully tendered the Association by the Navy Department; the collation served at Washington Barracks as a hospitable corollary to the admirable demonstration of hospital corps service; the delightful reception of Major La Garde in honor of Prof. Nimier at the Soldiers' Home; the informal reception given on the evening preceding the meeting, by the officers resident or stationed in Washington, in the banquet hall of the New Willard; and the collection of frequent knots of congenial spirits about the hotel tables, corridors and lobbies, where new acquaintances were gained and old acquaintance was deepened into lasting friendship,—all of them forming a feature well worthy of conjunction with the scientific and practical factors, the conjunction of which rendered the eleventh annual meeting of the Association of Military Surgeons of the United States, so memorable an occasion.



Robert Allin Blood

THE OFFICERS OF THE ASSOCIATION FOR 1902—1903

IN its selection of its officers for 1902—1903, the Association has acted with its customary sagacity and conservatism. Their names give assurance that there will be no revolutionary proceedings during the coming year, but that the policy which has proven so successful in the past will continue in the future.

Brigadier-General ROBERT ALLEN BLOOD, Surgeon General of the Massachusetts Volunteer Militia, President of the Association, was born at New London, New Hampshire, April 30th, 1838. His father, Luke W. Blood, was a native of Deering, New Hampshire, but the ancestors of the American branch of the Blood family, originally came from Scotland and settled in Concord, Massachusetts, in 1639. The Adamses, from whom his mother was descended, on the maternal side, came from England at about the same date, and were the first settlers of New London, New Hampshire. His great-grandfather, Simeon Blood, of Hollis, New Hampshire, with two brothers and other ancestors to the number of sixteen, served in the War of the Revolution. Simeon Blood and his brothers fought at Bunker Hill and in most of the principal battles of the Seven Years War. His grandfather, Ebenezer Blood, was a minute-man in the War of 1812, and his brother Simon died in the service.

General Blood was educated in the public schools of New London, New Hampshire, and at the New London Literary and Scientific Institution, a school of considerable prominence at that period. He studied medicine, graduating from the Harvard Medical School in 1870, and later, in 1873, began practice as a physician and surgeon at Charlestown, Massachusetts, where he has long resided.

His military record began August 13th, 1862, when he was mustered into the United States service in the Eleventh Regiment of New Hampshire Volunteer Infantry. His service was cut short at Fredericksburg, Va., December 13th, 1862, by a bullet which traversed the left groin. The wound was

supposed at the time to be mortal and for some weeks after it seemed impossible that he should survive. For nearly a year he was obliged to walk with crutches, and his recovery was slow and accomplished with much suffering.

In May 1895 he was appointed Lieutenant Colonel and Medical Director of the 1st Brigade, M.V.M., Brigadier General Benjamin F. Bridges commanding, and held that position until the sudden decease in 1896 of Brigadier General Edward J. Forster, Surgeon General of the State and first vice president of the Association of Military Surgeons of the United States.

He was then appointed by Governor Wolcott Surgeon General of Massachusetts with the rank of Brigadier General, May 28th, 1896. In this capacity during the five terms of office to which he has successively been appointed, he has sedulously labored, not only to perform promptly and effectively the routine duties of his office, but to assist the Commander-in-Chief and all his military subordinates in maintaining and improving the high standard of physical condition and efficiency of the Massachusetts Militia, and in those humane and beneficent labors which have always ameliorated the sufferings of such men of Massachusetts as have fallen in battle or by disease.

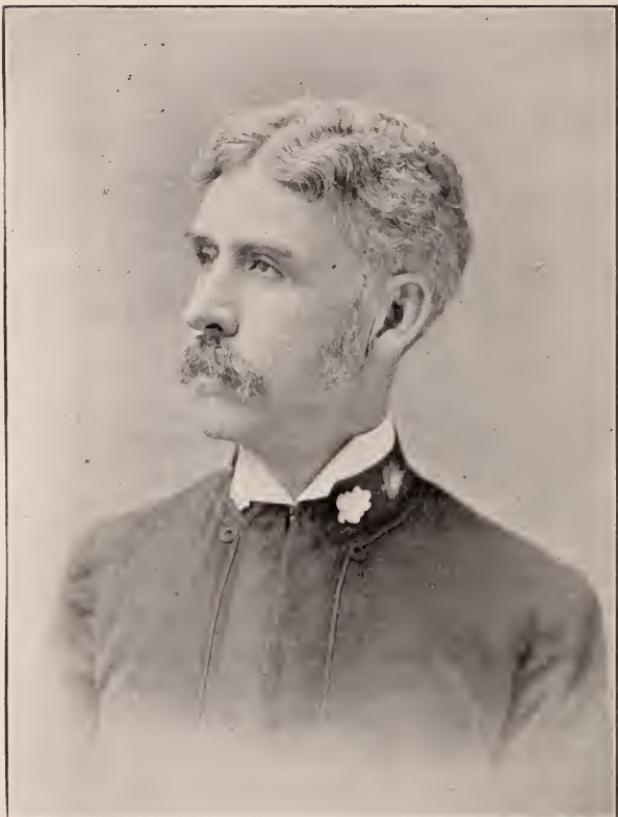
During the war with Spain, Massachusetts won new glory as she sent her troops, regiment after regiment, fully equipped and ready for duty, wherever they were needed. But in no detail was the equipment of those who went from Massachusetts more striking than in the quality of their medical and surgical arrangements. As they went forth, and after they returned, weakened and ill as a result of their experience in tropical, malarial and fever-plagued climates, the medical department of the Commonwealth was ever ready to do its duty; and never was it called upon to do something that it was not prepared to do. Through all those long and trying days, when disease was doing more than bullets to weaken the armies of the nation, Surgeon General Blood worked early and late, unmindful of his own personal comfort,—and the opera-

tions of the department were like clockwork. Acting under instructions from his Governor, Surgeon General Blood visited Montauk, where thousands of sick and suffering soldiers were temporarily encamped; he took personal charge of the great work in behalf of the Massachusetts troops, and did much to bring order out of chaos, and health and comfort out of disease and suffering. With special instructions from Governor Wolcott to spare no expense in affording the best of care and medical attendance to the soldiers of his state he devoted himself constantly to this work, and saw personally every sick man that belonged to the Massachusetts forces. Later he received instructions to proceed to Camp Hamilton in Kentucky, and Camp Meade in Pennsylvania and in both camps made a thorough investigation of the physical condition of the Massachusetts troops and their surroundings. His work did not end however with the close of the war. The medical supplies and the hospital outfits furnished to the troops in the field were transferred to the United States when the Massachusetts regiments were mustered into service, so that in the reorganization of the Militia there was entailed upon the Surgeon General a vast amount of labor in the purchase of new supplies and new materials,—the reorganization giving him the opportunity for making long-contemplated improvements in his branch of the State service, so that the Medical Department is now better arranged and more fully equipped than ever before.

Promptly upon his appointment to the Militia in 1895 he identified himself with the Association of Military Surgeons, and at the tenth annual meeting in St. Paul he was elected first vice president, a position previously held by the lamented Forster, who was also his predecessor in the surgeon-generalcy of his state. He has been very active in promoting the interests of the Association and, largely through his influence, practically the entire Medical Department of the Massachusetts Volunteer Militia is included in the membership of the Association. The activity and efficiency of General Blood along other lines is an indication of the great success which is to crown his administration of the twelfth annual meeting of the Association at Boston in the Spring of 1903.

He is a member—in addition to the Association of Military Surgeons of the United States,—of the Massachusetts Medical Society, the Medical Benevolent Society, the Boston Society for Medical Observation, the American Medical Association, the Middlesex South District Medical Society, and the Sons of the American Revolution.

Medical Director JOHN CROPPER WISE of the Navy was elected second vice-president of the Association at the Columbus meeting in 1897 with the expectation that he would progress naturally to the presidency, but the Spanish War, which overthrew so many well-laid plans carried him into the Pacific fleet of which he was the chief medical officer, and his presence was impractical



Medical Director John C. Wise, First Vice President.

ble at the following meeting. At the New York meeting, he again represented the Navy and was then advanced to the

first vice-presidency. Unable to be present at St. Paul, he has nevertheless continued his interest in the Association, and was cordially welcomed with re-election to the first vice presidency at the recent meeting. A man of high culture, broad views and liberal ideas his influence in every office which he holds will be altogether for the good of the Association, and for the honor of military and naval medicine.

Surgeon General WALTER WYMAN of the United States Public Health and Marine Hospital Service has been an officer of that organization since 1876, serving through the various grades until his appointment as Supervising Surgeon General in 1891. A full sketch of his many and effective accomplishments for the good of science and the best interests of his country will appear in a later number of the JOURNAL. His thorough scholarship, exceptional executive ability and rarely attractive personality have combined to render his administration of the Marine Hospital Service now expanded also into the Public Health Service, a period of the highest activity and efficiency. Under his direction, his corps entered actively into the military operations of the Spanish war, a distinguished member of his personal staff being commissioned in the volunteer medical staff and numerous others of his officers serving with the army, while through the quarantine and other established features of his work he cooperated effectively in the campaign. He became an honorary member of the Association in 1892 and transferred to the active list in 1901, in which year he also



Surgeon General Walter Wyman Second Vice President.

became second vice president, the office which he now honors for a second term.

Major JAMES EVELYN PILCHER served as assistant secretary in 1896-97, and is now beginning his fourth year as secretary and editor. He entered the Army in 1883 as 1st Lieutenant and Assistant Surgeon becoming Captain in 1888. He went out at the beginning of the Spanish war as surgeon of



Major James Evelyn Pilcher, Secretary and Editor.

the 22d Infantry, but a month later was detailed as Chief Surgeon of the United States forces at Jacksonville, and upon these forces being merged into the Seventh Army Corps,—having been meanwhile commissioned Major and Brigade Surgeon of Volunteers,—was detailed as Executive Officer of the Chief Surgeon's office and Medical Supply Officer and finally assigned to duty as officer in charge of the Medical Supply Depot

at Savannah. Becoming permanently disabled as the result of the exacting duties imposed by the War, he withdrew from active service in the Spring of 1899 and was placed upon the retired list of the army in 1900. As a member of the Committee on Military Medical Journal in 1894 and 1895,

he strenuously and energetically advocated the establishment of an association journal, although it was not until six years later, in 1901, that, with the approval of the Executive Committee, he was able to assist in the materialization of his own views by the inauguration of the JOURNAL OF THE ASSOCIATION OF MILITARY SURGEONS OF THE UNITED STATES, now a permanent feature of the Association. At the last meeting, he was made permanent Secretary.

Lieutenant HERBERT ALONZO ARNOLD, the efficient and indefatigable treasurer of the Association is an influential and prominent citizen of Ardmore, an ex-president of the Montgomery County Medical Society and a sanitarian of high standing. He entered the National Guard of Pennsylvania as medical officer, ranking as 1st Lieutenant, of Battery A and so remained from 1895 to 1899, serving meanwhile a five months tour as medical officer, Lieutenant, of the Pennsylvania squadron of Volunteer Cavalry, with which organization he participated in the invasion of Porto Rico in 1898. He is now senior assistant surgeon of the 6th Pennsylvania Infantry, and in his fourth term

as Treasurer of the Association of Military Surgeons of the United States. Under his management the funds in the Treasury have increased from \$1731.67 in 1899 to \$4253.26 in 1902. His tact, judgement and executive ability have done much to render the management of his office acceptable to the members, while his accuracy, integrity and loyalty have rendered his conduct of its finances invaluable to the Association.



Lieutenant Herbert A. Arnold,
Treasurer.

THE UNIFORM OF THE ARMY MEDICAL DEPARTMENT.

THE uniform, and the insignia in particular, of the medical and hospital corps of the United States Army have never been quite appropriate. Until fourteen years ago the only medical insignia worn was that of the Hospital Steward, who bore a caduceus on a half chevron of green. In 1887, upon the organization of the Hospital Corps, green trimmings were adopted for the uniform, and the Geneva red cross as the insignia of the new corps, the latter without authority and, as a matter of fact, in direct contravention of the Geneva Convention. In 1890, a shield—despite the objections of the Adjutant Generals' Department which had also long worn a shield,—was adopted for the insignia of medical officers, but four years later the modified maltese cross latterly in use was substituted for it; and in 1900 the same form of cross was extended to the hospital corps, a green color being used, which brought the insignia of the Medical Department into a fairly satisfactory degree of uniformity.

There are, however, still many objections to the uniform, improved as it is. The green color has been the especial mark of the sharpshooter from the days of the archers of England whose Lincoln green has been recognized throughout the world as the proper color for those who shoot to hit. Its appropriateness in the uniform of the huntsman, whose skill in marksmanship was gained by experience in the shades and swards of grove and forest, was easily seen. The green, which contributed to the concealment of the stalker of doe and stag through the grass and undergrowth of heath and vale, naturally remained in the garb of the same man when he followed his feudal lord upon foray or campaign. And, as in course of centuries, the huntsman of the woods developed into the rifleman of the armies, the green still stood as the color symbol of his functions,—a mark of surer death rather than of assistance in suffering.

Some shade of red however has marked the disciples of the healing art from the earliest time and throughout the entire

world. Baas remarks* of the Phoenicians that "it is known that their supreme deity, Baal-Zebul, the Beelzebub of the Bible, was a god of medicine and was interrogated even by the Jews as an oracle of health and disease. His priests were clad in garments of red." The persistence of red as significant of the art of medicine is shown by the fact that the medical departments of most modern armies are distinguished by facings of shades of the same hue. In Austria, the sanitary soldiers are marked by madder red; in Belgium and in Great Britain their corps is indicated by magenta; in Bulgaria they show facings of violet and in Germany they glow with scarlet trimmings; in Mexico they may be located by their carmine ornamentation while the Roumanian is appropriately distinguished by red.

Military medical work, unlike that of other departments of military service, is fraternal in character. Medical officers and sanitary soldiers are respected by all civilized belligerents, regardless of nationality. The adoption then of the same color for the decoration of the uniforms of the medical service in all nations, would conduce mightily to the distinction of its members from the combatant service, greatly facilitate recognition by the suffering on the field of battle and incalculably advance the efficiency of the service of aid in illness and injury.

The cross, sacred by nineteen hundred years of religious veneration, belongs to the church, and its blazonment upon the banners of the crusaders carries no right to its employment in a less pious campaign. Its use by the Knights of St. John--half monk, half warrior,—is no justification of its adoption as its insignia by a non-religious branch of the service, however humane its objects. The cross might logically enough form a part of the uniform of the representative of the church militant, the chaplain, but it has no special applicability to the medical officer. Moreover the red cross upon a white brassard, by the terms of the Geneva Convention, is al-

*Outlines of History of Medicine and the Medical Profession, by Joh. Hermann Baas.

ready an essential part of the uniform of all non-combatants in actual warfare, and its multiplication in other forms during peace is highly objectionable.

The caduceus on the contrary has been the symbol of healing since long before Tradition gave birth to History. The great deities of Egypt, Isis and Serapis, symbolic of the healing powers of nature, in sculptured form, always bore serpents as the emblems of health, and sacred serpents were always nourished in their temples as living images of the great deities of which they were the recognized shrines. Passing over to the west and entwined about a winged staff, the serpents became a part of the magic wand of Mercury, the seat and source of his power; in his hand it could lull the wakeful to sleep or reanimate the dead. Thence this

“caduceus, his snakie wand,
With which the damned ghosts he governeth
And furies rules, and Tartare tempereth.” *

was inherited by *Aesculapius*, the demigod of the healing art, from whom it has come down in an unbroken line to the present day. It has its place and its signification, unvarying and constant in all languages and among all nations. Whatever tongue an enemy may speak, the caduceus never fails to convey to him the idea of that help in the hour of need which it is ever the highest aim of the military medical officer to convey.

The suggestion then that the uniform of the United States Army medical department is to align itself with the medico-military ideas of the world by the adoption of maroon trimmings for the hospital corps and the employment of the caduceus as the insignia of the medical department is indicative of a move in the right direction—significant indeed of the qualities symbolized by the caduceus itself wherein the rod signifies power, the wings zeal and energy, while the entwined serpents imply skill and wisdom—all qualities eminently demanded in the department of which it is proposed to make it the insignia.

*Edmund Spenser.



The Sander Prize Essay.

THE MOST PRACTICABLE ORGANIZATION FOR
THE MEDICAL DEPARTMENT OF THE
UNITED STATES ARMY IN
ACTIVE SERVICE.

BY LIEUTENANT COLONEL VALERY HAVARD,
DEPUTY SURGEON GENERAL IN THE UNITED STATES ARMY.

Part One.

PRELIMINARY REMARKS

MODERN CIVILIZATION has not yet put an end to war between nations, but it has developed to a marked degree the sense of human solidarity and is endeavoring in every possible way to mitigate the horrors of the battlefield. The humane spirit which found expression in the articles of the Geneva Convention continues to expand and its benevolent effects will be distinctly felt in all future warfare. The wounded must receive the care and treatment which the latest developments of military surgical science have shown to be necessary and practicable, and any medical system which, in its organization or operation, falls short of the accepted standard will justly be held up to the scorn of civilized nations.

In this general advance toward a better comprehension of the claims of our suffering fellow-men, the United States has ever led the way and been a shining example. It may be said that the chief distinction between the medical department of our army and that of other armies is the liberality and generosity with which ours has been dealt with at all times by the government. In return for this, more is expected of it, proportionately, than of the medical departments of other countries, and the standard which is found suitable in Germany and France may not be acceptable in the United States. Our plan of organization must take into consideration available resources, public sentiment and the traditions of the service. Although we should diligently observe and study the results obtained by others for our information and guidance, yet our system, in so far as already evolved, stands, and in its future development will doubtless continue to stand, somewhat apart, original and distinctive. It is based on ampler lines and contains more generous provisions. It recognizes that ambulances and hospital baggage trains, are indispensable impedimenta, or, rather, that a well equipped medical department is not an impediment but, on the contrary, an important factor in the successful issue of a campaign.

The experience of all civilized nations has shown that the army surgeon must also be an officer, invested with the insignia and rank of the military hierarchy. It is only with the authority to command, that he can successfully handle the men under his direction, on or about the battlefield, and exert himself to the best advantage in behalf of the sick and wounded at all times. Every future campaign will show more and more clearly the intimate relations and inter-dependence existing between the line and the medical department, therefore how necessary it is for the surgeon to possess the moral influence which is only imparted by rank, and how ill grounded were the prejudices which for so long denied him his proper military status.

Experience has also demonstrated that the management of the medical department, in all its parts, requires special technical knowledge only possessed by medical officers, and

that any interference on the part of other staff departments is not conducive to the welfare of the sick and wounded, nor in the interest of the service. The best results will be obtained by granting it complete autonomy, including the full control of its personnel and material. In this manner only, can responsibility be fixed and the medical department escape the odium which mixed authority is almost sure to bring down upon it.

In a scheme of organization for the medical department of the United States forces, one labors under a serious disadvantage, namely the lack of a definite army organization. The composition of a regiment has been defined and forms a useful unit, but that of the brigade, division and corps is left undetermined. It is necessary, therefore, that our scheme be upon a flexible, adaptable basis, and that all rules be applicable to any body of troops, whatever its strength or composition.

It will be convenient, first, to take a general survey of the lines of surgical assistance in order the better to understand the nature and scope of the duties devolving upon the medical department in active service.

LINES OF SURGICAL ASSISTANCE:

1. The theoretical lines or echelons of assistance for the wounded on or near the battlefield, in all European armies, are three, namely:

The First Aid or Dressing Station (Collecting Station of the English, *Poste de Secours* of the French, *Truppenverbandplatz* of the Germans), behind each regiment.

The Ambulance Hospital (Dressing Station of the English, *Ambulance* of the French, *Hauptverbandplatz* of the Germans), behind each brigade or division.

The Field Hospital (*Hospital de Campagne* of the French, *Feldlazarethe* of the Germans), behind each division.

These lines constitute the service of the front and are characterized by their mobility, following the army and always in readiness on every new battlefield. Although their organization should be clearly laid down in regulations, it will be found, in practice, that the many unexpected events

of a campaign will greatly interfere with their perfect operation, and that the principal aim of the chief surgeon, should be, with a clear understanding of principles, to accommodate his resources to existing conditions in the most skillful manner, and to do the greatest good to the greatest number.

The service of the rear likewise includes three parts: the stationary and base hospitals which receive all patients not returned to duty; the evacuation of the disabled to and beyond the base; the replenishing of hospital and surgical stores. This service not having the importance of the first will be very briefly considered.

2. The above surgical lines of the front were the natural result of the evolution of the sanitary service in the field before the advent of the present small calibre rifle and jacketed bullet; these make such well defined lines impossible now, and render very difficult the formulation of rules not vitiated by many exceptions. In the warfare of the future I believe that only two lines will be found practicable and needful, the dressing station and field hospital. The ambulance hospital, which is nothing but a larger and better equipped dressing station, can be dispensed with (Par. 30, last clause). This does not mean that the patients shall need no assistance between the front and the field hospital, but such assistance can be rendered at the ambulance station if required, without the establishment of a special hospital for the purpose (Pars. 33 and 37).

3. The disposition of the surgical help can be better appreciated if we first glance at the disposition of troops when approaching the enemy and preparing for battle. They are formed in two or three lines: the first line consists of firing line, support and reserve, the reserve being about 500 yards from the firing line; the second line is 600 yards behind the reserve or 1100 yards from the firing line; the third line, if there be one, is 600 yards behind the second. When about 1000 yards from the enemy's position the firing line opens fire; as the troops advance, it gradually absorbs its support and reserve, while the second line draws nearer, ready to join

it when about 200 yards from the enemy for the final charge (*Wagner's Organization and Tactics.*)

4. The dressing stations are places where the wounded are brought together as soon as practicable for shelter and first aid, and with a view to their ulterior removal from the field. Their location will depend upon the nature of the terrain and circumstances of the fight; the above formation and method of attack show the impossibility of placing them in front of the second line, or anywhere nearer than about 1200 yards from the firing line at the beginning of the battle. It is best not to decide upon such location until, the troops having begun their movement forward under fire, the number of casualties is becoming great and the point is reached beyond which the Hospital Corps should not proceed.

The place selected should be that nearest behind the second line which affords reasonable safety to the wounded. As it will seldom be beyond the range of rifle bullets and never beyond that of artillery fire, all natural or artificial shelters should be taken advantage of; a valley, a gully or ravine, a hill, ridge, earthwork, railroad bank, wall, stone or brick building, &c., bearing in mind that any shelter liable to be knocked down by artillery fire is more dangerous than none, and that if the shelter be effective, the nearer it is to the front the less will be the danger from dropping shot and shells. If the place be near a road leading to the rear, or in proximity to such open country as will permit the approach of ambulances, so much the better. It is obviously a great advantage to be able to drive up to the dressing station and rapidly carry the wounded thence to the field hospital, but this cannot always be done; dressing stations are controlled by the nature of the grounds and exigencies of the front much more than by the desirability of an outlet; besides, they may be in operation before it is possible to ascertain whether or not they are accessible to vehicles. If it be found that ambulances cannot reach them, the patients, as soon as possible after examination and first aid, are carried on to the ambulance without being lifted from their litters.

If there be no available place in rear, the practicability of digging a trench and building a protecting earthwork should be considered. If this cannot be done, the patients are given such aid on the field as is possible and carried off directly to the field hospital; or else, which is preferable, after the battle a field hospital or section thereof is set up where lie the greatest number of wounded.

When the troops are on the defensive, specially if behind works or fortifications, and shelters are many, dressing stations are placed where most convenient; they will be unnecessary if the field hospital can be established sufficiently near.

5. There should usually be in our service one dressing station to each brigade, as there is one to each regiment (of 3000 men) in France and Germany. On account of the depth of the formation, one station in rear of its center will require but very little, if any, more work on the part of the litter bearers than if there were two or three stations, and it can be much more completely manned and equipped. There will be circumstances however, when the brigade is unusually large, stretched over a long line, or where the ground is broken and affords safe shelters, when a second or even a third may be usefully established. The opinion, formerly held, that each regiment should have its independent dressing station has been proved by experience to be unsound, involving a great waste of personnel and material; it is always better for the efficiency of the sanitary service to concentrate men and means than to divide them unnecessarily.

As already stated, it will not always be possible to drive ambulances to the dressing stations, either for want of roads or because of the danger of exposure to the enemy's fire; the patients will have to be carried on litters to the nearest ambulance station, that is, the place nearest to the front which ambulances can reach. At the ambulance station the wounded receive such additional treatment as may be immediately needed and are loaded into the ambulances for transportation to the field hospital.

6. The field hospitals are places where the wounded

brought from the dressing stations receive the first careful examination and treatment; here urgent operations are performed and permanent dressings applied. It is therefore necessary that they should be sufficiently far to the rear, well beyond the range of effective artillery fire. If the roads be good and the ambulance service adequate and well in hand, the distance can be much greater than if the roads are heavy, the ambulances few or the ground such as not to permit the use of vehicles. Three or four miles from the line of dressing stations will be far enough provided other conditions are favorable.

Places should be sought entirely sheltered if possible from stray projectiles, away from the rush of troops and supply trains but near, or readily accessible, to the main roads. Suitable buildings should be occupied if any be available. The vicinity of a brook, spring or well furnishing an abundance of pure water is of great importance.

One field hospital is attached to each division of troops. It is composed of as many completely organized sections (generally three) as there are brigades in the division, so that when a brigade operates independently it may be accompanied by its respective section.

Whether the entire hospital should be set up, or only one or two sections, is dependent upon the topography of the land, the strength of the units of the troops engaged and the severity of the fight. As a division goes into action one section should be erected in the most favorable location in rear, and, later, if necessary, a second and third are established where most required (Par. 38). Here, as in the case of dressing stations, scattering of men and material should be guarded against. Much care must be exercised in the selection of the best available places, as when once in operation the field hospital cannot be changed without much confusion and suffering.

If upon the arrival of the hospital train the enemy has withdrawn or been driven back, the field hospital, or sections thereof, should be set up as near the dressing stations as possible in order to save patients all unnecessary transportation.

CASUALTIES OF BATTLE. TRANSPORTATION AND HOSPITAL ACCOMMODATIONS REQUIRED.

7. It is expected that, in important battles, at least 15 per cent. of the troops engaged will be struck. The ratio of killed to the wounded being approximately one to four, it follows that the proportion of wounded will be 12 per cent., or 1320 in a division of 11000 men.* This proportion does not take into account the wounded of the enemy which, in case of victory, would fall more or less to our care; it must be considered, therefore, the minimum basis upon which provisions should be made for transportation and treatment.

Men with wounds of the upper extremities, or simple flesh wounds of other parts of the body, are not generally disabled and can find their way to the rear, at least so far as the ambulance stations. The number of such patients, from the statistics of the Franco-German and later wars, may be estimated at one third the total wounded, or 440. On the other hand, at least 110 of the men hit (1 in 12) will be so desperately wounded as to make it advisable to leave them, at least for a time, at the dressing stations. Enough transportation, therefore, must be provided to carry off 770 men within a few hours after the battle or, at least, before the following morning. Of these, one half can ride sitting up, while the other half require carriage in the recumbent position. The new regulation ambulance accommodates eight patients sitting up or four lying recumbent, and if we assume that it can make three or four trips from the dressing station to the field hospitals, at least 33 ambulances will be required, that is, a proportion of 3 per 1000 combatants. Any smaller number will result in either of two evils: some of the wounded will remain two or three days at the dressing stations where there is no provision for their comfort and safety, or they will be brought

*In the principal battles of the South African war the proportion was 1 to 4.8, in the Spanish-American war 1 to 5.7, and in the active part of the Philippine war 1 to 5.8. The proportion of killed would doubtless be greater and that of the wounded correspondingly smaller in a war against a more determined and better equipped enemy, fighting at shorter range. In the report of the Surgeon General for 1901, the ratio for the year 1900 in the Philippines is 1 killed for every 3.1 wounded, an unusually high proportion of killed, due, perhaps, to short-range shooting from ambushes.

to the hospital by large details from regiments whose strength may thus be dangerously depleted.

Of the patients brought to the field hospital a rather large proportion can at once continue their journey toward the base when, after examination, it appears likely that this added transportation will not endanger their recovery. Probably the number actually admitted for treatment in the field hospital will seldom exceed 600, but it is necessary that provision should be made for that number, and each section ready to admit 200.

PERSONNEL.

8. Experience has shown, and the medical officers in our service who have given the subject most attention are of the opinion that, in time of war, the non-commissioned officers and privates of the hospital corps, for all requirements of the sanitary service (care of property, dispensing of dressings and drugs, duties of litter bearers, nurses, cooks, orderlies, ambulance and wagon drivers, packers, mechanics, etc.) on the field, at the dressing and ambulance stations and at the field hospitals, should number *at least four per cent. of the strength of the command*. For the service of the rear, at the stationary and base hospitals and along lines of evacuation, one per cent. more will be required. To every 8 privates there should be an acting hospital steward, and to every 24 privates a hospital steward.*

The privates are of two classes: the hospital corps men proper, specially instructed in first aid and litter drill, and hospital corps transport men (drivers, mechanics, etc.). Both classes should be under the control of the Medical Department and wear the red-cross brassard.

9. In European armies, the hospital corps personnel proper (medical staff corps of the English, *infirmiers* of the French, *Lazareth Gehulfen* of the Germans), together with transport men (drivers, artificers, etc.), is less than 2 per cent. of the command, therefore manifestly insufficient for the necessities of the field. It is supplemented by details from

*The titles Steward and Acting Steward are incongruous and should be replaced by Hospital Sergeant and Hospital Corporal.

the regiments, ordered out to report to the Medical Department for duty when a battle is impending and returning to their commands as soon after the battle as their services can be dispensed with. These details from the regimental service are especially employed in carrying the wounded from the field to the dressing and ambulance stations. The system has the advantages of economy and simplicity, but its disadvantages are obvious: the men can only be indifferently instructed, if at all, in first aid and litter drill; not being incorporated and organized with the regular hospital corps, their work on the field will be more or less independent, not fully under the control of the medical officers; worse than this, regimental commanders will often fail to order their details to fall out on the ground that they cannot spare any combatants.

It seems best, therefore, that the hospital corps, in active service, should be a homogeneous body, sufficiently large for all the ordinary necessities of the field, its several elements with well defined correlated functions, so that all may cooperate most efficiently to the end in view. Even with a ratio of 4 per cent., it will almost always happen, after hard contested battles, that the demand for litter bearers will far exceed the available number of hospital corps men and that, in case of victory, details will have to be made from the troops.

10. On the eve of a war, as volunteer regiments are mustered in, it is essential that hospital corps men be enlisted *pari passu* with the line so that they may be organized and drilled before their services are needed on the battlefield. The government requisition which prescribes the quota of troops to be furnished by each State should also specify the number of hospital corps men. In each regiment of 1200 men, one per cent. (12 men), namely one steward, two acting stewards and nine privates, enlisted under the direction of the surgeon, should remain for duty with the regiment until it is incorporated in the division, when this regimental personnel becomes available for the divisional organization. The other 4 per cent. (48 men) should be enlisted under the direction of the Surgeon General of the State (under instructions from the

Surgeon General of the Army) and rendezvous at a central medical depot whence they are directly assigned to divisions. The large number of instructed hospital corps men daily discharged from the regular army will doubtless be a great help in forming the sanitary bodies of volunteer armies in times of emergency.

11. As there is no statute or regulation prescribing the strength or composition of the armies of the United States in time of war, a fixed sanitary system for our military service is therefore impossible; it is only practicable to formulate certain flexible rules readily applicable under varying conditions.

A division of troops is the most convenient unit upon which to base the organization of the Medical Department in the field. It must not be forgotten, however, that a division does not ordinarily operate alone, but that it is associated with other divisions, and that the sanitary organizations of all divisions in the same corps are interdependent under the supervision of the corps chief surgeon. It is also to be noted that there will be corps artillery and cavalry which may have to be specially provided for, outside the divisional services.

From precedents and existing regulations, we may assume that the infantry division will generally consist of 3 brigades, each brigade of 3 regiments, each regiment of three battalions, and each battalion of 4 companies. The division will also include 1 or 2 batteries of artillery, detachments of engineers, signal corps, &c., in all, about 11000 men.

Four per cent. will give, for the service of the front, a strength of 440 men, namely 64 non-commissioned officers (16 stewards, 48 acting stewards), and 376 privates. They form the personnel of the ambulance corps and field hospital. The ambulance corps mans the dressing stations and ambulance stations. It is divided into 3 ambulance companies (1st, 2nd, and 3rd) one for each brigade and capable of independent service with it in case of need. The field hospital personnel is likewise divisible into 3 sections corresponding to the ambulance companies (Par. 6).

This sanitary organization will suffice for the needs of the infantry as well as the artillery and cavalry which may act with the division. Cavalry operating independently should, of course, have its own service in the proportion of one ambulance company and hospital section to each brigade. It is expedient that each army corps should have attached to its headquarters, for special needs, an additional ambulance company and hospital section; the personnel for them, if necessary, can be drawn from the divisional services according to their strength.

There is another important element of personnel, not to be relied upon, but which, when present, may be utilized to great advantage, namely the members of regimental bands. The chief surgeon should ask that they be placed under his orders, and assign them to any work not requiring special technical skill.

12. The corps chief surgeon, with the approval of the Major General Commanding, exercises direct and immediate control over the medical service of the corps, subject to instructions from the army chief surgeon or the Surgeon General. He assigns all medical officers to their respective duties in standing orders so that, on the march or in battle, they may know and take their posts at all times without confusion. The most skillful operators are assigned to the field hospitals. He determines, after consultation with the division chief surgeons, (and with the assent of the General Commanding) the best sites for field hospitals. One of his chief responsibilities during and immediately after an engagement will be to ascertain the needs of his several divisions and transfer medical help from one to the other, should it become urgently necessary. He should call for reports of sick and wounded, personnel and material, as often as circumstances permit.

The chief surgeon of the division should make himself thoroughly acquainted with his personnel and means of transportation, and make the best possible use of them. On the battlefield he must see where the needs are most pressing and provide for them. As soon as a medical officer has completed

his special duties at one place he should be ordered to other work. All spare officers will be wanted at the field hospital after the close of an engagement.

The number of medical officers required for the service of the division, front and rear, should never be less than 40, or 4 to every 1000 men, namely, 30 for the front and 10 for the rear. In the service of the front, the medical officers will be as follows:

- I lieutenant-colonel, division chief surgeon.
- 1 major, commanding the field hospital.
- 1 major, commanding the ambulance corps.
- 3 majors and 4 captains, hospital surgeons; one captain permanent executive officer of the hospital.
- 3 captains, commanding the ambulance companies and for duty at the ambulance station.
- 17 captains and lieutenants, regimental surgeons, for duty at the dressing stations and the front.

13. Two line officers, not above the grade of first lieutenant, should be detailed in the medical service of each division as acting assistant quartermasters and commissaries, one for duty with the field hospital, the other with the ambulance corps. Each should have a mounted sergeant as assistant. Medical officers have but little aptitude for this work and cannot be spared from their more important professional duties.

14. The ambulance corps and field hospital (exclusive of officers) of an infantry division will be constituted as follows:

AMBULANCE CORPS.

Hospital Corps Transport men	Hospital Stewards	9	303
	Acting Hospital Stewards	27	
	Buglers	3	
	Ambulance Drivers	36	
	Ambulance attendants	36	
	Packers	6	
	Nurses and cooks	42	
	Orderlies	24	
	Litter Bearers	120	
	Farrier	1	
Blacksmith		1	316
Wheelwright		1	
Saddler		1	
Drivers of—		13	
Subsistence wagons		3	13
Baggage, &c. wagons		6	

FIELD HOSPITAL.			
Hospital Corps	Hosp. corps.		
	Hospital Stewards	7	
	Acting Hospital Stewards	21	
	Nurses and Cooks	66	
	Orderlies	6	
Transport men.	Blacksmith	1	
	Wheelwright	1	
	Saddler	1	
	Drivers of—		
	Surgical Wagons	3	
	Subsistence Wagons	6	
	Baggage, &c. Wagons	12	
			24
	Total,		440

Leaving the 4 mechanics of the ambulance corps out of count, each ambulance company will consist of :—

Hospital Stewards	3
Acting Hospital Stewards	9
Ambulance drivers	12
Ambulance attendants	12
Packers	2
Nurses and cooks	14
Orderlies	8
Litter bearers	40
Bugler	1
Wagon drivers	3
Total	104

15. Each company furnishes the necessary personnel and material to the brigade to which it is attached. The men should be permanently assigned to their duties so that they may assume them at any time without delay or disorder.

The personnel of the dressing station will consist, as nearly as possible, of 6 regimental medical officers (two for each regiment), 2 stewards, 6 acting stewards and 16 privates (nurses, orderlies and packers). If there be two stations to the brigade this personnel is divided as may be needful.

The personnel of the ambulance station will consist of the major in charge of the ambulance corps, the 3 captains commanding the companies, 1 steward, 3 acting stewards and 8 privates (nurses and orderlies). If any portion of the hospital personnel is available (Par. 24) or stations are consolidated, these details can be increased accordingly.

The six remaining acting stewards are placed in charge of the litter bearers, two for each ambulance company.

The ambulance corps and field hospital, although distinct organizations so far as their administration is concerned, are interdependant and mutually helpful. They must keep in touch with each other so that part of the personnel, when an emergency requires it, may easily be transferred from one to the other.

MATERIAL.

HAND LITTER.

16. The regulation hand litter of our service is the result of much intelligent study and experience, and, in my opinion, the best in the world for general field work. Although doubtless still susceptible of further improvement, it combines the qualities of lightness, simplicity, portability, strength and safety to a degree not equalled by that of any other army. Wheeled litters have been recommended and are more or less used in all European armies, but they are only possible on hard smooth roads and therefore of doubtful value on or near the battlefield. The litter laid on a frame resting upon a bicycle wheel has also been tried but with indifferent success.

The importance of litters in the service of the front can not be overestimated, and it should be one of the cardinal principles of our sanitary service that every measure must be taken to provide an abundant supply of them.

AMBULANCE.

17. The various kinds of ambulances until lately used in our service were mostly intended for two recumbent patients and otherwise defective. The last pattern, however, is a distinct improvement and by far the best field ambulance ever constructed in this country. Without adding to the weight, it possesses the inestimable and indispensable quality of carrying safely and comfortably four recumbent patients and of admitting them on their own litters, thus saving time and dangerous handling in loading. By letting down both seats or only one, it carries eight men sitting or four sitting and

two recumbent. Outside are two brackets upon which litters are carried; these brackets should be sufficiently large to carry two litters on each side. In front is a socket for the ambulance flag (Par. 238 A. R.).

Besides the regular baggage wagons, I also believe that the Medical Department should have subsistence wagons and surgical wagons, constructed for their own special purposes, so that their respective contents be conveniently grouped in sufficient quantities, each class in its appointed place and instantly accessible.

OTHER MEANS OF TRANSPORT. PACK MULES FOR DRESSING STATIONS. HOSPITAL MATERIAL.

18. In the absence of ambulances, or for places where they cannot go, various means of animal transport have been devised. The best known in European armies is the mule litter, chiefly used in France and England; it consists of a pair of couches, one on each side of a mule; seats (cacolets) can be carried in the same manner, or a couch on one side and a cacolet on the other. This means of transport requires strong and specially trained mules, and, on account of its breadth, is inadmissible on many trails; it has never been looked upon with favor in this country.

The two-mule litter, or litter suspended between two mules in tandem, has been successfully used on the western plains, but requires many animals and a straight road.

The single-mule litter, laid lengthwise on the back of the animal, has also been recommended, but is condemned by the severe jolting to which the patient is mercilessly exposed.

The Indian travoisi, as improved by Greenleaf and others, is probably, in the absence of wheeled vehicles, our best means of animal transportation, but, in my opinion, should be further perfected by making the rear ends of the poles rest upon a narrow two-wheeled truck instead of dragging upon the ground; such a truck would be greatly to the advantage of the patient and his assistants; it can be so constructed as to admit of being carried on pack animals. Two travoisi should be provided for each regiment in the field, to be car-

ried to the front on pack mules in case no ambulances are available.

19. Ambulances should be allowed in the ratio of one to each battalion or squadron, one to each two batteries of artillery, one to division headquarters. The number of horses required for the ambulances (2 to each), orderlies and mounted stewards of the division will be 90, exclusive of officers who provide their own mounts. The number of mules required for wagons (4 to each) and as pack animals will be 130.

20. Ambulances, if at all able to reach dressing stations can only do so comparatively late in the action and therefore cannot be depended upon for the large supply of dressings needed there from the beginning. For this purpose, light two-wheeled carts are used in Europe following each battalion (1000 men) or regiment (3000 men). In our service, such carts could seldom proceed far enough to the front; they should be replaced by pack mules which can follow the soldier wherever he goes. Such pack mules will doubtless be the best and often the only means of transport near the battle-field, each animal carrying two chests.* These chests should contain chiefly the simple dressings and other few articles needed at the front: first-aid packets, bandages, gauze, cotton splints, compresses, tourniquets, diagnosis tags, antiseptics, stimulants and restoratives; but there should be enough of these for at least 200 patients. One or two mules should thus be assigned to each brigade.

21. One subsistence wagon and two baggage wagons should be allowed to each ambulance company. The subsistence wagon carries cooking utensils, mess and food chests, stores for the sick and rations. The baggage wagons carry 3 wall tents for officers, the shelter tents of the hospital corps men, 2 hospital tents and 2 common tents for the ambulance station, a field desk, baggage, utensils, tools, forage, &c.

*The *aparejo*, although doubtless the best device for loading pack mules, is too complicated for the purposes of the Medical Department and should be replaced by a pad or blanket and a plain pack saddle.

22. The field hospital wagon train consists of 3 surgical wagons, 6 subsistence wagons, 12 baggage wagons and 1 field forge. The surgical wagons contain operating tables and all the instruments, sterilizers, medicines, dressings, appliances, &c., required at the field hospital; their contents are so arranged, in chests or otherwise, as to be quickly got out. The canvas comprises 6 wall tents and 3 common tents for the permanent staff, the shelter tents of the hospital corps men, and for each brigade section of the hospital; 1 hospital or conical tent as kitchen, 1 for subsistence stores, 1 for medical stores, and 20 hospital tents for wards, dispensary and operating room. This canvas provides for 4 to 5 per cent. of the command dangerously sick or wounded, and for more if the flies be used to extend wards. There should be on hand cots or spare litters for all the cases that the canvas will cover, together with blankets and pillows, as many bedsacks as possible, and a number of shirts, drawers and socks.

In addition to the above, the hospital train must carry the officers' personal baggage, 1 field desk, axes, picks, and spades for pitching and trenching tents, digging sinks, burying the dead, &c., and forage for horses and mules.*

The field hospital should also be supplied with an apparatus for boiling drinking water; the Waterhouse-Forbes sterilizer appears to be the most satisfactory so far devised for troops in the field.** A small acetylene plant for the lighting of the operating and administration tents is likewise desirable and practicable. An x-ray machine would be useless and in the way at the field hospital where only immediately necessary operations are performed (Par. 39).

ON THE MARCH AND IN CAMP.

23. On the march, the ambulance corps (personnel and material) is in the immediate rear of the division. The men

*If all the baggage cannot find room in the hospital wagons, the most necessary articles are carried along; the others are left at the base or some depot on the line of communication and sent for later if needed.

**Sterilization of water for troops in the field with description of apparatus, By Major W. Reed, U.S.A. *Proc. Ass. Mil. Surg.*, 1899.

of the 3 companies march together in column of fours, followed by pack mules, ambulances, surgical, subsistence and baggage wagons.

Whenever a brigade operates independently or at some distance from its division, as for instance in vanguard or reconnoissance duty, its ambulance company follows it.

Only the junior regimental surgeons march with their regiments, each riding in rear with his orderly. One ambulance, in charge of an acting hospital steward, also follows each regiment; two H. C. privates march in front of it; one of them rides on the rear step when it carries patients.

Any patient who cannot find room in his regimental ambulance is given a diagnosis tag which is also a permit to wait by the roadside for the ambulances of his brigade company.

24. The chief surgeon of the division is with the General Commanding. The captains in command of the ambulance companies are with their respective companies, under the direction of the major commanding the ambulance corps. The train of the ambulance corps, and immediately behind it, is in charge of a Lieutenant of the line, acting assistant quartermaster. (Par. 13).

The hospital train should be at the head of the light baggage train of the division. It is also in charge of a lieutenant of the line, acting assistant quartermaster (Par. 13). With it marches the hospital personnel, including the 2 mechanics. But if a battle is impending, the commanding officer of the hospital, his executive officer and two sections of his men follow directly in rear of the ambulance corps, so as to be able to locate and prepare the site for the hospital pending the arrival of the train. If the latter be long delayed or gone astray, they assist the ambulance corps.

25. At the end of the day's march, each company, with its ambulances and wagons, will bivouac as near its respective brigade as convenient; the necessary tents are pitched and every arrangement possible under the circumstances is made for the comfort and security of the sick and wounded. The

wagons of the ambulance corps will generally be sufficient to supply immediate wants, so that the hospital train need not be brought up until a more or less permanent camp is reached.

As soon as possible after the division goes into camp, surgeon's call is sounded in each regiment; the sick and wounded more than temporarily unfitted for duty are furnished with diagnosis tags and sent to the company ambulances.

It is unnecessary for the regimental ambulances to rejoin their respective companies, from which they may be far distant, at the end of each day's march, if they are able to carry, or otherwise procure, grain and forage for the animals.

The officers, stewards and privates detached with each regiment remain with it in camp, but may mess with their respective companies if conveniently near.

Every effort should be made by the chief surgeon to evacuate all serious cases to the rear or leave them in local hospitals by the way; if necessary, part of the field hospital is set up and left behind for this purpose.

26. In a permanent camp, each regiment should have on duty with it 2 medical officers, at least 2 stewards and 6 H. C. privates, and be provided with an ambulance and team.

There is no regimental hospital; each regiment has one hospital and one wall tent, as office and dispensary, where the sick report at surgeon's call; patients requiring hospital treatment are sent directly to the brigade or division hospital. So long as the division is closely united the division hospital answers all purposes and remains consolidated; if the line be much extended, the hospital may be divided into its several sections, each being placed in convenient proximity to its respective brigade and ambulance company.

The field hospital may occupy suitable buildings if any are available; otherwise it consists of hospital and conical tents (Par. 22) arranged in three lines, one for each brigade, the lines radiating from a centre where are the operating, dispensing, administration and mess tents; or else forming a triangle with the above tents inside of it.

The ambulance corps, if united, is camped in the vicinity

of the hospital. If, as will be generally the case, the companies are separated, each is camped in the most suitable place in rear of its brigade, the officers and men on one side of the picket line, the ambulances and wagons on the other.

27. The sanitary rules which should control the establishment of a permanent camp, so as to prevent the production and propagation of disease, are of the highest importance and worthy of the best efforts of medical officers. More lives can be saved by their intelligent application than by the observance of the most approved methods of treatment on the battlefield, and an experienced hygienist will often be of much greater benefit to an army than the most skillful surgeon.

The first and most important rule is that very large bodies of men should not be encamped together unless required by stern military necessity. A division of 10,000 or 11,000 men should be the largest command located on any one site, and so disposed that no part of it can be polluted by the drainage of any other part. The water must be strictly guarded against contamination and, if not above suspicion, should be sterilized by boiling, the Waterhouse-Forbes sterilizer having been found best for the purpose (Par. 22). The disposal of excreta is a troublesome problem but one which must be solved if the usual camp scourges, typhoid fever and dysentery, are to be prevented. The sinks should be carefully disinfected with earth, quicklime or ashes three times a day, and every man who fails to use them severely punished. A much better system, whenever practicable, is the removal of all feces from disinfected latrine troughs by means of odorless excavators and their burial as far away as possible or incineration in crematories. The part played by the mosquito in the propagation of malarial and yellow fever must be borne in mind and action taken accordingly wherever these diseases are apprehended. All fever cases of a suspicious nature should be promptly isolated until a definite diagnosis is made.*

*To be concluded in the September Journal.

NOTE ON BOLO WOUNDS.

BY CARL DE WOLF BROWNELL, M.D.

PASSED ASSISTANT SURGEON IN THE UNITED STATES NAVY.

IN compliance with the editorial request, in the February number of the JOURNAL OF THE ASSOCIATION OF MILITARY SURGEONS OF THE UNITED STATES, for reports on the subject of bolo wounds, I have to report, from notes taken at the time, and which I regret were not more complete, on eleven cases, that I saw in May, 1898. They were all Spanish soldiers or sailors under treatment at the hospital established at Cavite, P. I., by Aguinaldo. The wounds were located as follows: 6 of scalp; 1 of scalp and a punctured wound of right side; 1 of forehead and right forearm, with a superficial gunshot wound of the right cheek; 1 of left forearm; 1 with a clean amputation through the carpus of the left hand. With the exception of the amputation and the punctured wound of the right side, which was superficial and healed readily, all were simple incised wounds, but rather long and deep.

But two required operative interference: (1) In the case of the amputated hand, it was necessary to sacrifice the lower extremities of the radius and ulna to obtain flaps. (2) The wound of the right forearm, anterior, middle third, resulted in a secondary hemorrhage from the radial artery ten days after the wound was received; for which the artery was tied on both sides of the erosion.

Before coming to the hospital, formerly a convent, these patients had been from one to four days without treatment, and the conditions at the hospital were most unfavorable. There were not enough cots for the patients, and many had to lie on the bare floor; the wards were filthy, overcrowded, and ill-ventilated; the food consisted of a meagre allowance of

rice with a little boiled beef, and the patients having no money, could not buy fruit or other luxuries; the dressings were unclean and infrequently changed. As might have been expected, all of these wounds suppurred; yet all of the patients, ultimately, made good recoveries. None of the wounds, with the exception of the amputation at the wrist, would have been at all serious, if properly dressed at first. In connection with this injury it should be noted, that, to offset the eleven Spaniards with bolo wounds, there was not one Philippino among those in the hospital (there were more Spaniards than Philippinos, to be sure) with a bayonet wound; and the suspicion may be entertained that these wounds were inflicted after surrender and not during an engagement.

The bolos that I saw among the Tagalogs, were long, straight, pointed, heavy knives, of various sizes, and not to be compared with the truly formidable barong, or parang, of the Moros.

THE NEW OHIO MEDICAL DEPARTMENT LAW.

THE new Ohio National Guard law recently passed, does away with regimental surgeons, and establishes a medical department, including medical officers and an enlisted hospital corps. The officers comprise an assistant surgeon general with the rank of lieutenant colonel; ten surgeons with the rank of major, two for duty with brigade headquarters, and eight for service with regiments; and thirty-four assistant surgeons with the rank of captain, who are to be assigned to duty with battalions. There is no time limit to the service of commissioned officers, although the hospital corps men are enlisted for four years. The hospital corps consists of a hospital steward and five privates attached to division and to each brigade headquarters; and a hospital steward, three acting hospital stewards, and twenty privates for each regiment. The surgeon general is not included in the medical department but, it is greatly to be regretted, remains a member of the governor's staff, subject to appointment on political grounds. All other medical officers belong to the permanent establishment entirely free from the caprice of regimental commanders.

NECROLOGY OF THE ASSOCIATION FOR 1901-1902.

BY MEDICAL DIRECTOR GEORGE PERLEY BRADLEY, U.S.N.,
CHAIRMAN OF THE NECROLOGY COMMITTEE.

I HEREWITH present the names of those members whom death has removed from our Association this past year.

By the care of the Secretary, almost all the interesting facts of their official life and career have been collected, and

permanently preserved in the Personal Record. As time does not admit of presenting these records in full, I furnish a very brief abstract of them to the Association, in the chronological order of decease.



Captain Selden Johnson Mudge.

He was a graduate of Buffalo Medical College, in 1877; after
(96)

Selden Johnson Mudge, 1st. Lieutenant and Assistant Surgeon National Guard of New York, was born at North Tonawanda, New York, May 24th, 1851. Son of Warham and Sarah (Ross) Mudge.

practicing in Bradford, N. Y. about a year, he settled in Olean, N. Y., where he remained until his death, which occurred April 19, 1899. He joined the Association of Military Surgeons of the United States in 1895, and his commission in the National Guard dates from April 12, 1887. He had the highest reputation both socially and professionally in his community, and only the advancing disease of which he died, prevented his entering upon active service in 1898, during the Spanish war.

Louis Stanislaus Tesson, Major and Surgeon, in the U.S. Army, was born in St. Louis, Mo., Feb. 14, 1842, the son of Edward P. and Lucia M. Tesson. He held degrees of A.B., A.M. and M.D. from the University of St. Louis, and almost all his professional life was passed in the Army, first as Acting Assistant Surgeon in 1864, as 1st. Lieutenant and Assistant Surgeon in 1875 (Regular Army), Major and Surgeon in 1895, until his death on June 7, 1901, while serving as Chief Surgeon of the Department of the Columbia. He was a member of the American Folk-lore Society and of the Association of Military Surgeons from November 8, 1895. He had a long and distinguished record of service in the field from 1864 and later in Wyoming, Nebraska, Arizona, Montana and Washington.



Major Louis S. Tesson.

William Hudson Daly, Major and Chief Surgeon United States Volunteers (War with Spain) died at Pittsburg, Pennsylvania, June 9, 1901, at the age of 59. He was a native of Virginia (or of Pennsylvania according to other newspaper

reports, from which this notice is necessarily taken) but was a resident of Richmond at the outbreak of the Civil War, and enlisted while still a youth, in the Confederate army. He saw service in some of the early battles, but was taken prisoner and subsequently served as Acting Assistant Surgeon in the U.S. Army. He was a graduate of medicine from the Uni-



versity of Michigan, 1866, studied much abroad, and practised as a specialist in laryngology for many years in Pittsburg, once serving as Chief Surgeon of the Pennsylvania National Guard. He was elected President of the American Laryngological Association in 1894 and 1897, was a member of the American Medical Association and British Medical Association among others, and several times represented the former at international meetings. In 1898 he was appointed Major and Chief Surgeon of

Major William Hudson Daly.

Volunteers, and served during the war with Spain on the staff of the General Commanding the Army: his membership in the Association of Military Surgeons of the United States dates from that year.

Samuel Kerr Crawford, Major and Surgeon, National Guard of Missouri, was born near Belfast, Ireland, December 25, 1838, son of Thomas and Ursilla (Kerr) Crawford, and died at Sedalia, Mo., of which city he was then Mayor, June 30, 1901. He came to this country at the age of 17, and after a scientific course at the University of Michigan, took his degree in medicine from the Albany, New York, Medical College in 1857. He served throughout the Civil war in the Union Army as a medical officer, being once wounded, and later

practiced his profession in Warsaw and Sedalia, Mo., until 1898, when he served in the 2nd Regiment Missouri Volunteers, throughout the Spanish war, the age limit being waived to allow him to enter the field. He became a member of this Association May, 1898.

Milo Buel Ward, Major and Brigade Surgeon, U.S.V. a native of Ohio, was born in 1848, and was graduated in medicine at Keokuk, Iowa, in 1879. He practiced his profession in Kansas, in Chihuahua, Mexico, where he was chief of the hospital department of the Mexican



Major Samuel Kerr Crawford.

Central Railway till 1885, when he removed to Topeka, Kansas, and subsequently to Kansas City, Mo., where he died July 28, 1901. He was commissioned in 1898 during the war with Spain and served with credit at Chickamauga. He was professor of clinical gynaecology in the University Medical College (Mo.), and of diseases of women and obstetrics at Kansas City and Topeka, and was distinguished among the Surgeons of the South West. His membership in our Association dates from 1899.



Major Milo Buel Ward.

Alwin Gustav Edmund von Coler, Surgeon-General

General Alwin von Coler.

Commodore) U.S. Navy, retired, died at New York, November 17, 1901. He was born in Philadelphia in 1833; was graduated at the Philadelphia College of Medicine and Surgery, 1852, received the degree of A.M. from Princeton in 1854, and entered the Navy as Assistant Surgeon in 1855. He passed through the various grades of the service, being retired as Medical Director in 1895. He paid special attention to the subjects of naval hygiene and sanitation during his active service and afterward, and published many papers upon them. He was for many years the Naval delegate to the American Medical As-

German Army, Chief of the medical section of the Ministry of War with rank of Major General, a distinguished corresponding member of this Association, died at Berlin, Germany, August 26, 1901. For any sufficient sketch of the life and services of this very eminent officer, we must refer to the British Medical Journal of September 28, 1901, and to the "Tidskrift i Militär Halsovard," 1901.

Albert Leary Gibon,
Medical Director (with rank of

Medical Director A. L. Gibon.

sociation and American Public Health Association, was at various times vice-president and president of both, and was president of sections on Medical Geography, Climatology, and Military and Naval Hygiene, in various international Congresses at Washington, Berlin, &c. He was also successively second vice-president, first vice-president and President of this Association, 1894-1897.

Rush Shippen Huidekoper Lieutenant Colonel and Chief Surgeon U.S. Volunteers, born at Meadville, Pa., May 3, 1854, died at Philadelphia, December 17, 1901, was the son of Edgar and Frances (Shippen) Huidekoper. His early education was at Phillips Academy, Andover, Mass., and he was a graduate in medicine of the University of Pennsylvania in 1877, taking honors for his thesis. He spent much time in London and Paris hospitals, and served in those of Philadelphia. He soon devoted himself to comparative anatomy and veterinary surgery, in the latter branch taking high honors in the famous school of Alport, France, and later studied under Virchow, Koch and Pasteur; with this unusual equipment in all departments of medicine, he occupied the chair of veterinary sciences, which was founded chiefly through his efforts, in his own university, from 1894 to 1889, when he removed to New York. He published many books and papers there, and was professor in the New York College of Veterinary Surgery. He was connected with the National Guard of Pennsylvania for many years from 1877, and in 1898 was appointed Chief Surgeon of Volunteers with rank of Lieutenant Colonel and



Lieut. Col. R. S. Huidekoper.

served at Chickamauga and in Porto Rico. He was an active member of our association from 1899.

George Bayles, Major and Surgeon of United States Volunteers, born in New York city 1836, died in Orange, New Jersey, December 20, 1901, was the son of James and Julia (Day) Bayles. His early education was liberal, under private instructors, and he was graduated in medicine from the College of Physicians and Surgeons, New York, in 1859. He held hospital appointments in New York after graduation under Dr. C. R. Agnew, and had experience as surgeon of emigrant packet ships. In 1862 he entered the volunteer medical service as Assistant Surgeon, and served during the civil war, chiefly in garrison camps and post hospitals. In 1898 (during the Spanish War) he again served at Fort Hancock as post surgeon. During his long professional career he was a member and officer of many medical societies, and was examiner for life insurance. He became a member of this Association in 1894.



Clayton Parkhill, Colonel and Surgeon-General, National Guard of Colorado, retired, son of William and Rebecca (Gilchrist) Parkhill, was born at Vanderbilt, Pennsylvania, April 18, 1860, and died at Denver, Colorado, January 16, 1902. He was graduated from Jefferson Medical College, Philadelphia, in 1883, and was house-surgeon at the Philadelphia Hospital. In 1885 he removed to Colorado, where he became Professor of Surgery in the Gross Medical College of Denver, which he helped to found. He was distinguished as a surgeon, devised a number of novel operative procedures and

several surgical instruments and contributed largely to the literature of this branch of the profession. In 1895 he organized the Denver City Troop of Cavalry, and commanded it about two years.

He saw service during the Leadville riots of 1896-7, and was Surgeon-General of Colorado from 1894 to 1898, when he entered the U.S. Army as Major and Surgeon 1st. Colorado Regiment, soon became Brigade Surgeon, and rendered valuable services at Chickamauga and Porto Rico. He became an active member of our Association in 1895.



Colonel Clayton Parkhill.

Benjamin F. Pope, Colonel and Assistant Surgeon General U. S. Army was born in Rome, Oneida county, New York, February 24, 1843, and died in the Philippine Islands, as chief Surgeon Headquarters of that Division on February 14th, 1902. Colonel Pope's professional career, after graduation from Albany Medical College, 1864, was almost continuously in the U.S. Army, at first as Assistant Surgeon 10th. New York Heavy Artillery from July 18th, 1864 to July 19th, 1865, when he was honorably mustered out



Colonel Benjamin F. Pope.

at the end of the Civil War. He was acting Assistant Surgeon in the U.S. Army from April 8th, 1867 to May 24th 1867; was appointed Assistant Surgeon May 14th, 1867, and thenceforward rose steadily through the various grades, receiving his last promotion January 1st, 1902. During the war with Spain in 1898 he served as Chief Surgeon of the 5th Army Corps at Tampa, Florida, and Santiago, Cuba, and as Chief Surgeon Headquarters Division of the Philippines, at Manila from April 26, 1901, to the date of his decease at that place. He was a member of our Association from 1897.



Lieutenant Christian Fenger.

Christian Fenger, (honorary member of this Association, 1901) Lieutenant and Assistant Surgeon, (retired) Danish Army, was born in Copenhagen November 3, 1840, and died at his home in Chicago, Illinois, March 7, 1902. He studied medicine at his birth-place, and while yet a student, served his country in the Schleswig-Holstein war. He received his diploma in 1867, and served as Surgeon in the Red Cross Ambulance with the French Army during the Franco-Prussian war. He afterwards studied under Billroth, and for two years

was Surgeon-in-charge in Cairo, Egypt. In 1877 he came to this country, and immediately took a leading position as a great clinical and scientific surgeon and teacher. Even a reference to his international and distinguished reputation is superfluous, before this Association.

James P. Kimball, Colonel and Assistant Surgeon General U.S. Army, was born in Berkshire, New York, August

21, 1840, and died at Onteora Park, New York, April 19, 1902. The son of John Fuller and Ruth (Ellis) Kimball, he held the degrees of A.B. and A.M. from Hamilton College, New York, and that of M.D. from Albany Medical College, in 1864. His entire professional life was passed in the medical corps of the U.S. Army, in the volunteer service Army of Potomac, in 1865, and in the regular Army from 1867 to the time of his death. In passing through the various grades from 1st Lieutenant and Assistant Surgeon, he was much employed in the west-



Colonel James P. Kimball.

ern territories, and in various campaigns against the Indians. His last active service was as Chief Surgeon Department of the Missouri, 1900-1901, and he was retired for disability incident to service in April 1902. He was an active member of this Association from 1895.

John Brooke, Major and Surgeon U.S. Army (retired) was born February 22, 1830, in Chester county, Pennsylvania, and died at Radnor, Pennsylvania, May 11th, 1902. He began his military service in the Army



Major John Brooke.
as Acting Assistant Surgeon June 24, 1862; he was appointed

1st Lieutenant and Assistant Surgeon November 22, 1862; was brevet captain and major March 13, 1865, promoted Captain and Assistant Surgeon July 28, 1866, and Major and Surgeon, March 25, 1882. He was retired from active service by operation of age law February 22, 1894. During this period he served frequently as Acting Medical Director and Surveyor in departments of the West and South, from New Mexico to Alaska, as member of examining boards in the East, and on detached duty at the Columbian Exposition in Chicago. He became an active member of this Association in 1897.



Colonel Dallas Bache.

Dallas Bache, Colonel and Assistant Surgeon General U. S. Army (retired) was born in Washington, D. C., January 23, 1838, and died at San Diego, California, June 2, 1902. He entered the army as Assistant Surgeon May 28, 1861, and served throughout the Civil War, in the field with the Army of the Cumberland, in the General Hospital, Nashville, Tenn., at West Point, and in the Mower general hospital at Philadelphia. He was breveted Captain and Major, March 13, 1865,

for

"faithful and meritorious service," and after the Civil War served in various departments of the west and south, holding the position of Medical Director of the Platte for nine years. From December 1898 to January 1902, when he was retired at his own request, he served in the office of the Surgeon General of the Army at Washington. He became an active member of our Association in 1894.

EDUCATION OF MEDICAL OFFICERS FOR THE PUBLIC SERVICE.

BY JOHN CROPPER WISE, M.D.,

MEDICAL DIRECTOR IN THE UNITED STATES NAVY.

I INVITE the attention of the Association to the subject presented in the title of this paper, "The Education of Medical Officers for the Public Service". I can claim the attention, and sympathy of every member present, for whether we are of the Army or Navy, the Marine Hospital Service or the National Guard, we have most things in common, all of us entering the Service from civil life, with a general professional education and with no special preparation for the important duties we are called upon to discharge.

Probably more than any other, the American people, evince the highest degree of versatility: in our great civil war the civilian attained to the highest grades of military rank and command; any educated and prominent citizen seems available for consular and diplomatic duty, yet as a rule, these are instances where men arise by inherent ability, and we cannot for a moment doubt, that their work would have been more complete, had they been educated for their calling.

In the discussion of questions of public policy we naturally look about us, to inquire how the problem has been solved by other powers, for nations, like individuals, are much influenced by their neighbors. So, in the consideration of this subject, let us see what European States have done and are now doing in order to prepare the officers to whom is entrusted the high duty of caring for the health of their armies and fleets.

The French Naval Medical Schools were founded by M. Dupuy, as long ago as 1715. This distinguished officer was principal surgeon of the port of Rochefort. He is presented

to us as a man of lofty spirit, great ability, and untiring industry. His attention was called to the wretched condition of the medical service in the French Marine, by innumerable complaints of the ignorance and inefficiency of those serving on the ships. M. Dupuy at once addressed himself to the Minister of Marine, asking the adoption of a plan of instruction, in the hospitals at Rochefort, where young men could be qualified as Naval Surgeons. Not being successful these recommendations were renewed with greater insistence in 1716 and again in 1717 and 1719. The time was auspicious and the needs urgent; the naval wars under Colbert, brought to the seaports of France wounded and dying men with no adequate hospitals to receive or Surgeons to attend them. In 1720 we find M. Dupuy before the Naval Commission of France urging the great needs of the French Marine for an improved Medical Department. Gaining, by earnest advocacy, not only in the cause of humanity, but experience, the aid of the High-Admiral and the King, he convinced these persons that medical schools should be an essential part of the hospital, where curing and teaching should go hand in hand, Medical Officers seeing daily and studying the diseases they were to encounter on ship-board and in all quarters of the globe.

Though successful in an humble way, the efforts of M. Dupuy resulted in the formation of the school at Rochefort—and with its inauguration, the aid of the King was more efficient, the Monarch expressing deep gratification at M. Dupuy's efforts and finally gave him carte blanche to do anything for the improvement of the Marine Medical Service. A special ordinance provided that the schools should be used for no other purpose and that medical officers should be classed with other officers in all respects. Succeeding the school at Rochefort, those at Toulon and Brest were inaugurated. These schools are held to-day in greatest esteem by the French Nation; it was said of them in the Chamber of Deputies in 1836: "The organization of the Medical Schools of the Navy, which exist in our ports, invariably tends to produce that high capacity, and tried courage, the influence of which, however in-

direct, is so powerful upon the success of our naval operations." It is a striking fact that amid all the political perturbations of this highly civilized nation, these schools have continued to receive the confidence and support of the government. I cannot refrain from quoting Medical Director Dean of the Navy, whose investigations in this direction, make us so much indebted to him. He says: "For the encouragement of those, who may some day undertake, to secure for our service so great an advantage, let it be observed that here, it was achieved, after many disappointments, repeated refusals, and much indifference from those high in authority."

Matriculates in the French schools are required to be citizens of France, and at least 18 years of age. They undergo a rigid physical examination and must be a "bachelor of letters" or "bachelor of science". Attendance on lectures and other work is compulsory. Discipline is sufficiently rigid, and punishment ending in dismissal, is permissible. The annual course is divided into two sessions, one in winter, one in summer; subjects are lectured upon three times a week, and each professor completes his course once in two years. The matriculates are classed in two divisions, promotion from one to another being by examination, a second failure in which is cause for dismissal. Assistant Surgeons remain under instruction two years, six months of which is passed at sea. At the end of the two year course there is a leave of absence on full pay granted, for presentation before some of the faculties of France permitted to grant diplomas. For all expenses incurred in obtaining their degrees, Assistant Surgeons are reimbursed from the funds of the Department of the Navy. In return for receiving a medical education without cost, an Assistant Surgeon signs a contract to remain in the Service for ten years. The position of Assistant Surgeon is open to graduates of other schools, (as in England,) receiving after admission, a course of special instruction.

We cannot leave this part of our subject without mentioning some of the alumni of these schools, who have shed lustre not only on French, but general medicine.

Larrey was educated at Brest, and served on the "Vigilante" and other ships from 1777 to 1788.

Broussais was also a student at Brest, graduating in 1794.

Recamier was examined at Toulon in 1795. He served in a naval engagement with the English fleet, in which 4000 were killed including the senior medical officer.

Contemporaneously with Dupuy in France, John Bell was laboring in England to establish a great School of Military Surgery, and chairs created for these branches in the University of Edinboro were first occupied by himself and Ballingall.

It remained, however, for the war in the Crimea to give Military Medicine in England, the impulse it had received so much earlier in France; this struggle developed the inefficiency of the Commissariat and Medical Departments of the English Army; prior to this date, however, such men as Sir Ranald Martin and Robert Jackson had urged the necessity for reform. Edward Parkes put this matter before the public mind in language so apt, so graphic and yet so forceful, that as Dean remarks, it will ever remain the text of those engaged in medico-military advancement. Parkes says: "The State employs a large number of men, whom it places under its own social and sanitary conditions. It removes from them much of the self-control, with regard to hygienic rules, which other men possess, and is therefore bound by every principle of honest and fair contract, to see that these men are in no way injured by its system. But more than this, it is as much bound by its own self interest. It has been proved over and over again, that nothing is so costly, in all ways, as disease, and nothing so remunerative, as the outlay which increases health, and in so doing, increases the amount and value of work done." While all must admire the high humanity of the great professor of Military Hygiene and while his work will ever be to us an inspiration, yet a dispassionate consideration of this proposition, will show that it is not only extreme but impracticable.

Fortunately at this time Lord Herbert was Secretary of State for War, a man of enlarged views and great humanity

and to him, the success of better conditions is mainly attributable. In 1857 a Royal Commission was appointed to examine into the sanitary condition of the Army, and one of the greatest results of its work, was that of enlarging the sphere of action of the Medical Officer; it invested him, not with the power of caring for the sick alone, but it clothed him with the infinitely more important duty of preventing disease. Not until the Regulations of 1859, was he authoritatively concerned in all matters affecting the health of troops. The Commission advised that in order to enable the army surgeon to do his duty efficiently, an Army Medical School should be established, in which the specialties of military medicine and surgery, hygiene and sanitary medicine should be taught the young medical men of the Army. This was the inception, and resulted in the founding of the Army Medical School at Netley, and the fact is full of significance, "that the founding of a medical school was deemed by the Commission the first step necessary to effect an improvement in the sanitary condition of the Army."—*Dean.*

The Army Medical School at Netley was organized in 1860: in 1872 the school was extended to the Naval service. In 1880 the Naval Medical School was removed to Hasler.

The system of admission to the Army and Naval Medical Schools of England are similar. Graduates in medicine, after passing the required entrance examination, are commissioned and ordered to one of the schools. The course at the Naval school covers a period of four months, and comprises subjects relating solely to military medicine. An examination, theoretical and practical, is held at the end of this session, the questions having been approved by the Director-General of the Navy. Surgeon Gatewood, U.S.N., in an elaborate monograph (*Notes on Hospitals, Medical Schools and Training Schools for Nurses*) says of Hasler: "This school is so practical, and so far reaching in its influence, that it is well worthy of imitation by all nations." Medical Director Dean, speaking of the Army School at Netley, remarks: "The most marked feature of this admirable school is undoubtedly the De

partment of Hygiene, which stands unrivalled by any other similar school in Europe or America; the instruction given here, is, in my opinion, the most advanced exponent of modern military medicine, in its broadest and most comprehensive sense. So vast is the field and so manifold the subjects treated of in this division, that it would almost seem as though, it ought to be a school in itself. Rapid, concise, but systematic and thorough teaching, is given in the whole principles of hygiene, and their application to military life, in every aspect and relation. The great work of which the Professor of Military Hygiene here is the author is nominally the textbook, but the range of instruction transcends that of this invaluable volume, and reaches to most of the finished acquirements of medical scholarship.

"In addition to the daily practical exercises in the routine branches of hygiene, interesting information is imparted on such collateral subjects, as the comparative healthfulness of different races and their mental and physical adaptability to military and naval service; influence of climate on health and life; geographical distribution of disease and mortality over the surface of the earth; influence of malaria; effects of animal emanations on health; relation of disease to over-crowded surface; defective drainage as predisposing to epidemics; the science of ventilation; accounts of animals from which food can be derived; relative value of meats dried, smoked, salted and fresh; marks of disease in animals; signs of wholesome and unwholesome meat; the art of cooking; nutritive value of various grains used for food; the sources, collection, storing and distribution of water; clothing; vital statistics; transmissibility of disease; influence of light on health and disease; epidemic influences; plans of hospitals; burial of the dead, and many other subjects of practical importance."

Can any one doubt, after a perusal of this list of subjects, every one of great importance to the welfare of armies and fleets, the difference which must exist between the acquirements of the civilian medical man, and the military medical officer? And furthermore, can any one doubt the need of a special school for imparting such knowledge? Connected with

the English Schools for military medicine we read the names of Longmore, McLean, Aitken, McDonald, DeChaumont and Parkes—all distinguished in military medicine.

We come now to the consideration of the education of the military medical officer in Germany, and as we would expect, this great power is not behind her western neighbors in this matter, for here military life is incumbent on every male inhabitant, and in such a state, so important a matter as the health of the Army and Fleet, is not likely to be intrusted to unskilled hands. A large number of the Medical Officers in the German Services have entered much as they do in England. All males being liable to military service, medical students are allowed the privilege of serving their first six months in the ranks, and then to obtain their discharge, upon the condition that after they have finished their university course and passed their State Examinations, they re-enter as Assistant Surgeons and serve in that capacity for six months more. If such officers, so elect, they can remain in the service, and are in regular line of promotion, etc., but are obliged to take post-graduate courses in the nearest University to their garrison town, at regular intervals. At this time most of the medical officers receive their education at "The Friedrich Wilhelm's Institut", formerly called the "Pepiniere". This school was founded in 1795 through the efforts of Surgeon General Görcke, and later was combined with the "Medizinische-Chirurgische Akademie für das Militär". These institutions furnish, at Government expense, a complete course of study at the University of Berlin and, besides the special training of the Medical Officer, going even into the details of official clerical work, drills and equitation.

The condition of admission to the German schools are, viz:

- 1st. Citizenship in Germany.
- 2nd. Proof of legitimacy of birth.
- 3rd. Age not above 21 years.
- 4th. Completion of gymnasium course.
- 5th. Physical qualification for military service.
- 6th. Agreement of parent or guardian to pay monthly 30

marks for a pupil at the Institut and 75 marks at the Akademie.

There is also required a payment of three hundred and twenty marks for clothing and equipment.

The instructors in the medico-military branches are officers of the Army and Navy, who while under these orders are considered as holding professorships in the University of Berlin.

We can conclude from the considerations presented, 1st, That the leading military powers of the world consider special training necessary for the Military Medical Officer. 2nd, That schools where military medicine is taught, and owned by the State, exist in all first-class powers.

I have endeavored to show how important this matter is, and is held to be in the older States of Europe; how, in their experience, untrained men in the medical corps are as undesirable as they are in the line, and furthermore, let us bear in mind that these great beneficent changes were brought about, only after the most untiring effort on the part of their promoters.

The United States to-day has no adequate provision for instruction in branches peculiar to military medicine: true enough our country is young and has devoted its almost fabulous energy to industrial development; yet while this is true no people have a stronger military spirit or evince a higher genius for naval affairs; this statement was true even before the Civil War, for at that time the Merrimac (which became later the famous Confederate ram) was the model frigate of her day. The iron-clad was an American invention. It has been noted by writers on political economy, while admiring the success of our polity in most directions, that we are lacking in finished detail and completeness. Heretofore we have been occupied within ourselves, if it can be so expressed, but an impetus and importance which we cannot restrain, enlarges our limitations and irresistably forces upon us foreign relations and makes us *nolens volens* a participator in the world's activities; this clearly means an increase in the Army and in the Naval force; indeed the appropriations for this year carry a great increase. It being conceded that the two great

arms of the national defense are thus so largely augmented, the need of technically trained medical officers becomes an absolute necessity.

That this view is entertained by the present wise, and able officer, who is Surgeon General of the Army, we are assured in the establishment of an Army Medical School in this city, which has done excellent service in the training of the young medical officers of the Army; a similar establishment for the Navy has been in operation at the Naval Laboratory in New York, but it is contemplated removing the school to the Museum of Hygiene in this city. As the details of the Army Medical School have been published, in the Proceedings of the Association, it is deemed unnecessary to enter into a consideration of it here. As the English schools for the Army and Navy extend their facilities to officers of the Indian Medical service, so we can hope that medical officers of the National Guard and Naval Reserve may similarly benefit from our own institutions. That such schools do better work separated, rather than combined, has been amply demonstrated in the experience of the English, who commencing together have now the two admirable establishments, at Netley and Hasler, for the Army and Navy. The great difficulty in our experience in the Naval Service has been that officers could not be spared a sufficient length of time and in sufficient number to reap all the benefits, which the school can bestow, and I feel assured, that the Army, with the great demands on the medical department, must have experienced the same difficulty.

If war is inevitable, if large armies and fleets must be maintained, let us hope not only in the interest of patriotism and efficiency, but also in that of humanity, that our country will do all that is necessary to advance the usefulness of these schools, and thus provide an adequate number of thoroughly equipped medical officers.

DISCUSSION.

MAJOR WALTER REED, U.S.A.:—I had not proposed to take part in any discussion concerning the training of the medical officer; and yet every one of us will admit that in the United States, at least, it is a subject of very greatest importance. We

have endeavored to do something as a commencement in the Army Medical School in this city in which we have trained, I think, something like forty young men for their future duties as medical officers. This instruction has consisted in a course in military hygiene, military medicine, military surgery and clinical microscopy. Of course we are only in the beginning. Our school lacks very much the proper equipment and proper laboratory facilities. We expect, however, in the future, through the aid of this Association especially, to enlarge our school. I, for one, am thoroughly in sympathy with the idea which I believe the President in his address this morning mentioned, that is, a combined school for the instruction of officers not only of the Army but of the Navy and the Marine Hospital Service. I think there is room in this very city for the establishment of such a school. I believe Medical Director Wise states that in England it has been found necessary to separate the schools. Just why they need a separate school for the instruction of naval medical officers, I do not at present understand. I do not know that naval hygiene differs from military hygiene. I think the one crying need is instruction in hygiene in its broadest sense, and I think that we could combine a medical school managed to train the officers of the three services to very much greater advantage than we can under the present arrangement.

MEDICAL DIRECTOR JOHN C. WISE, U.S. Navy.—A propos of what has been said of the combination of schools for the Army and Navy, I simply stated the facts. I am something like Major Reed. I cannot see any very good reason why schools for the Army and Navy should not be taught in the same buildings and by the same professors. The fact remains, however, that the English tried the experiment and that after the army and navy men had been educated together for something like eight or nine years, the Naval men eventually took possession of the Hasler Hospital and went into it. I do not wish to be considered as objecting at all to the idea that we could not very advantageously work together. The subject of naval hygiene, however, I must confess is somewhat technical. The navigation of a ship is a very difficult subject to understand and there would be many questions which would arise of use to one branch but not to the other. Possibly that could be easily settled, however, by the establishment of two chairs—one occupied by a naval and the other by a military surgeon—each treating of the same great principles of hygiene and in addition of the special principles applicable to the particular service.

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Brigadier General William Henry Forwood, Surgeon General, United States Army.

Editorial Department.

SURGEON GENERAL WILLIAM HENRY FORWOOD,
UNITED STATES ARMY.

THE mutations of military service which have brought to the head of the medical department so efficient and accomplished an officer as the recently appointed Surgeon General of the Army,—who happily was at the time of his appointment, the senior officer of his corps,—have given uniform satisfaction in all directions. General Forwood was born in Brandywine Hundred, Delaware, on the 7th of September, 1838 and received his preliminary education in the public schools and Chester Academy of Chester, Pa. After graduating in the Medical Department of the University of Pennsylvania, he was appointed assistant Surgeon in the army, his first commission bearing the date of August 5, 1861. His introduction to military service was in the capacity of executive officer of the Seminary Hospital at Georgetown, D. C., but after a few months he was assigned to active service first as surgeon of the 14th Infantry and later as acting medical director of Sykes' division of the 5th corps of the army of the Potomac. On duty in the office of the medical director in Washington for five months, he again saw eight months active service as surgeon of the 6th Cavalry in Stoneman's division when he was disabled by wounds received in action. His civil war service was concluded with tours of duty as executive officer of the Satterlee Hospital in Philadelphia, and in command of the medical storeship, "Marcy C. Day", and the Whitehall General Hospital near Bristol, Pa. Whitehall General Hospital, which had a capacity of 2000 beds, was built by General (then Lieutenant) Forwood and remained under his command to the end of the war.

He took part in numerous engagements, including Yorktown, Gaines' Mills, Malvern Hill, the second Bull Run, Antietam, Gettysburg and Brandy Station. A paper upon the operations of the medical department at the battle of Antietam was contributed by him to the last meeting of the Association, and will be published in the JOURNAL during the coming year. Whatever there was of hard service during this period was shared by him; he frequently attended the wounded under fire, his horse was killed under him at the battle of Fairfield and he was severely wounded through the right breast at the battle of Brandy Station. His gallantry in bringing off Lieut. James F. McElhone, 14th Infantry, who had fallen severely wounded within the enemy's lines at Gaines' Mills, was an instance of the conspicuous valor which uniformly attended the performance of his duty.

In the long period of nominal peace which prevailed between the Rebellion and the Spanish war, he saw much duty under many varied circumstances. At Fort Riley in 1866 he fought alone an epidemic of cholera which carried off twenty-seven out of fifty-nine cases. In 1870, he devoted a leave of absence to the study of yellow fever at the quarantine station near Philadelphia, in order that he might familiarize himself by actual contact with that disease. From 1866 to 1870, he was on frontier duty in the Department of the Missouri; from 1870 to 1872, he was at Fort Brady, Michigan; from 1872 to 1876, he was in Texas; from 1876 to 1879, he served in the Department of the South, and from 1879 to 1882 in the Department of the Platte. During this latter tour of duty, he acted as surgeon and naturalist to the military reconnaissances and exploring expeditions conducted in the northwest by Lieutenant General Sheridan, on the last of which, in 1883, President Arthur and Secretary Robert T. Lincoln were present. From 1882 to 1886 he was attending surgeon on the staff of General Sheridan at Chicago and from 1886 to 1890 he was chief surgeon of the Department of Dakota.

In 1890, he entered upon a prolonged tour of duty at the Soldier' Home near Washington. During most of his service

here he occupied the chair of Surgical Pathology and for a time that also of Military Surgery in the Medical Department of Georgetown University; and in recognition of his work, the University conferred upon him the degree of LL.D. When the Army Medical School was organized, he became Professor of Military Surgery, a chair which he occupied with signal ability until the suspension of its work consequent upon the Spanish war; upon the resumption of its sessions after the war, he returned to the school, this time as President, a position which he held until his promotion to the command of his corps.

Upon the return of the army of invasion from Cuba to Montauk Point, he was assigned to duty as chief medical officer of the great convalescent camp which terminated the first stage of the Spanish war and by the tact, energy, and efficiency which he manifested, he brought order out of chaos and placed the work of the camp in an excellent sanitary situation. When later the return of the volunteer regiments necessitated the establishment of a great General Hospital at Savannah, General Forwood selected the location and supervised the work of construction, until in December 1898, he was ordered to San Francisco as chief surgeon of the Department of California—a station then assuming especial importance because of the increasing prominence of the hostilities in the Philippines. Early in 1901, he returned to Washington as principal assistant to the Surgeon General, a duty which he continued to perform until his own promotion to that office.

In detail, General Forwood served as assistant surgeon (Lieutenant), five years, 1861-1866; as assistant surgeon (Captain), ten years, 1866-1876; as surgeon (Major), fifteen years, 1876-1891; as deputy surgeon general (Lieutenant Colonel), six years, 1891-1897; as assistant surgeon general (Colonel), four years, 1897-1902; and has left,—much to the regret of his many friends in the profession and in the service,—but three months to serve as surgeon general and round out his full quota of forty one years as a medical officer of the

United States Army, during which he has occupied every grade in his corps with honor to himself and credit to the service.

General Forwood is the author of numerous important professional contributions, conspicuous among which are his monographs upon Military Surgery in Dennis' System of Surgery and in Warren & Gould's International Textbook of Surgery. He was for a number of years editor of the *Military Surgeon*, published in Washington in connection with the *National Medical Review*.

TACTICS IN MILITARY-MEDICAL SERVICE.

ONE of the youngest branches of military-medical science is tactics in the sanitary service, for short called merely *tactical sanitary service*.

Long ago it was recognized that the thorough medical training of military surgeons did not suffice alone to meet the demands made on the sanitary service in war. That could be done only if the *organization* and *direction* of the sanitary service were adapted to the military requirements.

From that, there followed as a matter of course the necessity of military and tactical training for military surgeons. But the suggestions with regard to this matter which were made in the seventies of the last century, in Germany (by the then lieutenant-colonel, afterwards General and War Minister Verdy du Vernois) and in Austria-Hungary (by the major of general-staff Bilimek) met with no response, although William Roth the well known Surgeon-General in his "*Jahresberichte ueber die Leistungen und Fortschritte auf dem Gebiete des Militaer-Sanitaetswesens*" (Annual Reports on Achievements and Progress in the Department of Military Sanitary Service) also took up their cause.

Not till the middle of the nineties did people begin to take the matter up again, and officers of the Austrian-Hungarian General Staff are entitled to the credit of having written the first publications on the subject. They were followed

by some Austro-Hungarian military surgeons, then by military surgeons of the German army, and later by Frenchmen and representatives of other European armies.

By *tactical sanitary science* we understand the science of the use of the sanitary establishments on the *field of battle*; the science of the application of all the available sanitary means and establishments at the *seat of war* must in conformity with the sense be designated *strategical sanitary service*.

There are two methods of training and perfecting in tactical sanitary service, namely by means of the map and in the field itself; the former prepares for the latter and must serve as a makeshift, as field exercises require time, and besides it is necessary to have different kinds of ground.

Theory here is just as indispensable as in every other branch of science, but the chief thing is practical exercises with the aid of special examples; this is the so-called "*applicatory*" method of the study of field service, as carried out by the officers of all branches of the service.

During the last few years this method has been diligently practised by the medical officers of the European armies. The means employed are: written tactical exercises, sanitary "*Kriegs spiele*" (war games), mounted sanitary-tactical excursions, and participation in the journeys of the general staff.

In this way the army surgeon should train himself under given military and local conditions to dispose the sanitary establishments at his disposal to the best advantage.

At first smaller problems are taken, and then progressively greater and greater ones, *e. g.*: A detachment, consisting of several battalions of infantry, a squadron of cavalry and a battery of artillery occupies a camp, makes a march, and has an engagement. Then the principal medical officer of that detachment has in the council according to the military conduct assigned to him, and in accordance with the verbal orders of the military commander-in-chief, in strictly chronological order and by word of mouth to state what are his decisions, measures, reports, etc. This is in a similar way required of the chief-surgeons of divisions, army corps, and armies, and of

the commanders of bearer companies (ambulances), field hospitals, etc.

Wisely enough, in order to make these sanitary tactical exercises approach real war as nearly as possible, they have been based on episodes and phases from military history.

Thus the author of this paper has made the battle of Custoza (1866)* and the operations of the Austrians in South Tyrol (1866)** the bases of sanitary tactical problems.

It is necessary for the military surgeon to work out as many such lessons as possible under the most different circumstances, in order to obtain practice in adapting the sanitary service to the given military situation as well as possible. To that end it is necessary for the army surgeon to acquire a knowledge of the fundamental principles of reading maps, tactics, the effect of different weapons, transportation, etc. Nowadays these are indispensable aids for the military surgeon, who, indeed, is not only a medical man but also a soldier.

By means of this knowledge the military doctor gets nearer to the officers of the combatant troops; he increases his military standing with and his influence over the soldiers, which in the end enhances his medical authority.

In the Austro-Hungarian army in every large garrison, where several military surgeons are stationed, during the winter months under the guidance of a general (or higher staff officer) and the principal medical officer "Sanitaets Kriegs spiele" (sanitary war games) take place, at which persons taking part have to solve a greater or less problem according to their position. As far as possible in summer tactical applicatory discussions are held in the field.

At the examination for staff-surgeon (major) the solution of such applicatory problems within the sphere of the chief-surgeon of division and army corps is required. Whoever

*Der Sanitaetsdienst bei der Reserve-Division von Rupprecht in der Schlacht bei Custoza 1866. (The Sanitary Service with the Division von Rupprecht in the Battle of Custoza 1866). Vienna; Safar, 1898.

**Applicatorische Aufgaben aus dem Sanitaetsdienst im Gebirgskriege. (Applicatory Lessons on Sanitary Service in Mountain Warfare.) Vienna, Safar, 1899.

wishes to attain the rank of a medical general must have taken part in a practice march of the general staff in which the work of a chief-army-surgeon is involved.

The fundamental principles of these military tasks are taught the young military surgeons at the "Military-Medical Applicatory School" in Vienna.

Sanitary tactics are cultivated in a similar manner also in Germany and Switzerland, as well as in France, in which last country a military surgeon of high rank teaches tactical sanitary service at the military academy.

Sanitary tactics will become of increased importance for American military surgeons, now that the United States has inaugurated a world power policy, and since it appears not impossible that one day the American army will have to take part in a great war carried on according to the modern rules of tactics and strategy.

In conclusion I will call attention to some of the most important publications on the subject of sanitary tactics.*

The applicatory methods are best explained in the writings of Colonel Hausenblas *Der Sanitaetsdienst bei einer Infanterie-Truppen-Division im Felde.* (Sanitary Service in the field with an Infantry Division) Vienna 1896, which was the first work of the kind; then the extensive work of Colonel Küsmanek and Captain Von Hoen *Der Sanitaetsdienst im Kriege,* (The Sanitary Service in War) Vienna, 1897; and the *Aufgaben-Sammlung zum applicatorischen Studium des Feld-Sanitaetsdienstes* (Lessons on the Applicatory Study of the Sanitary Service in the Field) Vienna, Safar, 1901, by Staff-Surgeon Cron and the author of this paper.

Staff-Surgeon (Major) Cron of Vienna is one of the most zealous champions of sanitary-tactical study. In his excellent book *Beziehungen des Feld-Sanitaetsdiensts zum Felddienste* (Relations between Sanitary Service in the field and Military Tactics) Vienna, Safar, 1902, he makes the first attempt to systematize sanitary tactics, and a successful one too. In his

*In this connection the valuable paper of Colonel Woodhull on Military Medical Problems (*Proc. Assn. Mil. Surg. U.S.*, Vol. vii, 1897), should be considered.—EDITOR.

Zehn Beispiele aus dem Gebiete des Gefechts-Sanitätsdienstes (Ten Examples of Sanitary Service in Battle), Vienna, Safar, 1902, Staff-Surgeon Cron shows even to the smallest detail how sanitary service in the field has to be carried out.

In Germany sanitary tactics are represented by Lieutenant Colonel von Oven's *Taktische Ausbildung der Sanitäts officiere* (Tactical Instruction of Military Medical Officers) 2nd edition, Berlin, 1901; by Loeffler's *Taktik des Truppen-Sanitätsdienstes auf dem Schlachtfelde* (Tactics in Sanitary Service on the Battlefield), Berlin, 1899, and most recently by the excellent work of Chief Staff-Surgeon Dantwiz *Ueber sanitäts taktische Ausbildung der Sanitätofficiere der Armee*, (Instruction in Sanitary Tactics for Army Medical Officers), Berlin, 1901.

One of the very first to treat of sanitary-tactical subjects was Colonel Bircher of the Swiss Army Medical Corps in his *Neue Untersuchungen ueber die Wirkung der Handfeuerwaffen*, (New Investigations on the Effect of Fire-Arms), Aaran, 1897.

Among the French the first to be mentioned is Chief Staff-Surgeon Bénech with his book *Le Service de Santé en campagne* (Sanitary Service in the Field), Paris, 1902.

Thus we see that the officers of the general staffs and the military surgeons in all large armies are devoting much attention to sanitary tactics, and there is no doubt that in a future war the knowledge of this subject will bear rich fruit for the benefit of the sick and wounded defenders of their country. JOHANN STEINER, *k. und k. Regimentsärzt* (Vienna).

Reviews of Books.

NEW BOOKS ON FIRST AID.*

THE recent accentuation of interest in first aid in railway accidents is largely due to Dr. Charles R. Dickson of Toronto, whose unwavering attention to the subject has kept it constantly before railway surgeons. His brochure is the fruition of many years of labor in this direction and was prepared at the request of the International Association of Railway Surgeons as a brief, simple and easily understood textbook for railway employees. The author has worked out his subject in concise and direct language and compressed a remarkable amount of work into a remarkably small space, resulting in quite the best first aid primer yet produced.

Dr. Doty's *Prompt Aid* has seen thirteen years of successful circulation. Always one of the best of the more comprehensive works on first aid, each of its four editions has been a distinct advance upon its predecessors. The anatomical and physiological facts are stated with clearness and fullness and the technical points of symptomatology and treatment are well put. The Halstead litter however has not been employed by the army for twelve years, its use having been superseded by the present form with stirrup-shaped strap-iron legs in 1890. The chapter on hygiene is particularly good as would be expected from so distinguished a practical sanitarian as the author, and well rounds out a thoroughly practical and valuable handbook.

**First Aid in Accidents.* By CHARLES R. DICKSON, M.D. 16mo. pp. 127, 31 illustrations. Chicago, Fleming H. Revell Co. 1901.

A Manual of Instruction in the Principles of Prompt Aid to the Injured. By ALVAH H. DOTY, M.D. Fourth Edition. 12mo. pp. xvi, 302. 120 Illustrations. New York, D. Appleton & Co., 1902.

HYGIENE AND PUBLIC HEALTH.*

THE name of Parkes,—through the labors of the older Parkes, whose Military Hygiene was the chief authority of the last century, and through the five preceding editions of the present work prepared by its accomplished senior author,—has become a synonyme for authoritative opinion in matters of Hygiene. The tendency of late years has looked toward prophylaxis even more than toward therapeusis. Books upon hygiene and monographs upon sanitation have sprung up on all sides. Where formerly preventive medicine was confined to the work of the military surgeon, it is now extended to all public medical officials and enters into the work of the general practitioner as well. Coming out during the early stages of the movement toward public health, in the development of which it was itself largely instrumental, the work of Parkes has by its successive editions always kept well to the front. Its reputation is amply sustained by this sixth edition, in which the assistance of Dr. Kenwood has been employed with material advantage. The twelve chapters comprised in the book cover the fields of (1) Water, (2) Collection, Removal and Disposal of Excretal and Other Refuse, (3) Air and Ventilation, (4) Warming and Lighting, (5) Soils and Building Sites, (6) Climate and Meteorology, (7) Exercise and Clothing, (8) Food, Beverages and Condiments, (9) The Contagia—Communicable Diseases and their Prevention—Hospitals, (10) Disinfection, (11) Statistics, and (12) Sanitary Law and Administration. Each of these subjects is treated with judgement and intelligence. The omission of yellow fever from consideration in chapter 9 seems strange when beri beri and plague are the subjects of ample consideration; it is hoped that this omission is anticipatory of a near period when that disease will not demand attention. The chapter on sanitary law and administration treats entirely of the English regulations with reference to public health and is especially serviceable to American readers as a series of suggestions to officers preparing similar legislation for this country.

**Hygiene and Public Health.* Sixth Edition. By LOUIS PARKES, M.D., D.P.H. and HENRY KENWOOD, M.B., D.P.H.. Small 8vo. pp. xx, 732. 1901. Philadelphia, P. Blakiston's Son & Co., Publishers.

PROPOSED JOURNAL FOR THE BRITISH ARMY MEDICAL SERVICES.

WE understand that the expediency of establishing a journal to be devoted to matters concerning the [British] Army Medical Services has for some time past been under the consideration of the Director General. Sir William Taylor has issued a circular to the officers of the Army Medical Services asking for an expression of their views on the subject. It is pointed out that the proposed journal would to a great extent take the place of the present appendices of the Army Medical Department Report, and would embrace the following items: (1) Original articles written by officers belonging to the Army Medical Services, and others. (2) Bibliographical notes on articles of importance and interest to the military services. (3) Reprints and translations from military, medical, and other journals. (4) Official gazettes, and official information generally, bearing upon the Army Medical Services. A journal conducted upon these lines would, it is hoped, enable medical officers to keep in touch not only with what is going on in the British service, but with the advances and changes that are being made in other armies. The journal would be conducted and edited under the supervision of a committee representative of the Headquarters Staff, the Medical Staff College and the Advisory Board for Army Medical Services, and to this committee officers who have made special studies of any subject are invited to give their names as referees on that particular subject. The pages of the proposed journal would not be open to controversial correspondence, or to items of social or personal interest, other than what is official. The annual subscription would not in any case exceed £1. The Director-General expresses the hope that there will be no hesitation in supporting this effort to maintain a high standard of professional and scientific attainment in the Army Medical Services. If the circular elicits proof of a strong feeling in favour of the establishment of such a journal it might be possible to extend the proposal to the establishment of an institute similar to that of the Royal

Artillery and Royal Engineers in London. Military medical journals already exist in many other armies, and there can, we think, be no doubt, that such an organ would serve a very useful purpose by drawing together the medical officers of the army, the volunteers, militia, and Colonial forces, etc. We hope, however, that if the scheme comes to maturity it may be possible to include matters concerning the medical service of the Royal Navy in the scope of the new journal. This would increase the interest and scientific value of the periodical, and, by giving it a larger basis of support, would be a source of strength. It may not be out of place to recall the fact that the establishment of an army medical journal has more than once been suggested, but the proposal has not hitherto found favor in the eyes of authorities, who made no secret of their belief that such an organ would be a "Grumbler's Gazette." Sir William Taylor has wisely determined that everything in the nature of personal controversies and grievances shall be excluded. It is not for us to suggest to the authorities of the medical services the form or the arrangement of the journal which they propose to establish. We may, however, venture to hint that in the *Journal of the Association of Military Surgeons of the United States* they have an excellent model of what such an organ should be.—*British Medical Journal.*

THE NEW ENGLISH MILITARY MEDICAL SCHOOL.

SUPPLEMENTARY to the valuable paper of Medical Director Wise on the "Education of the Medical Officer," it is announced that a Medical Staff College is about to be established in London. This will take the place, on an extended and more comprehensive basis, of the famous Army Medical School at Netley, which will be closed as a school, although the clinical facilities afforded there will continue to be utilized in connection with the new institution until a new hospital, now under construction at Millbank, is ready for occupation.

ORIGINAL MEDICAL INVESTIGATIONS OF THE
SURGEONS OF THE IMPERIAL
JAPANESE ARMY.

BY SURGEON CAPTAIN K. TAMURA,

DELEGATE FROM THE IMPERIAL JAPANESE ARMY.

I FEEL it a privilege to be able to attend this meeting of the Military Surgeons of the United States as a representative of the Military Surgeons of Japan, and an honor to have the opportunity of reading to you a paper containing an account of certain medical investigations made by some of the surgeons of the Imperial Japanese Army. You know, however, that it is difficult to speak correctly in a foreign language, especially when it involves the use of technical terms. My medical studies were conducted in the German language at the Imperial University, and my knowledge of English is limited. Consequently I fear that I may not be able to express myself altogether to your or my own full satisfaction. But I hope that you will bear with me and lend me your kind assistance in bringing forth the correct meaning of what I have to say.

Under the general head of my paper, I wish to speak first of the—

TRANSMISSION OF MALARIA BY MOSQUITOES IN JAPAN.

Since July of last year Dr. Tsuzuki, Surgeon Major, under official orders, has conducted a series of investigations regarding the connection between mosquitoes and malaria in Japan, first in the Island of Jesso, in the northern part of the Empire, and afterwards in Formosa, in the South, both of them noted as malarial regions, and then in the main Island, especially in the neighborhood of Tokyo. The results of his investigations have been reported in the Official Gazette and several medical publications.

On the 23rd of July last year he discovered for the first time a species of female mosquito belonging to the Genus *Anopheles*, but not quite identical with those *Anopheles* concerning which reports have been made by several American and European authors. So he named it *Anopheles Jesoensis*, Tsuzuki, and described in his reports its forms and its habits.

In Formosa he discovered two other species of *Anopheles* which he named, respectively, *Anopheles Formosaensis I* and *II*, Tsuzuki. According to his observations these three species of *Anopheles* must be the transmitters of malaria in Japan.

Although Dr. Tsuzuki found other kinds of *Anopheles* differing somewhat from these three kinds, they appear in such small numbers that he did not regard them as of any especial significance in connection with the question of the transmission of malaria.

The principal morphological qualities of these three kinds of *Anopheles* are as follows:—

	WINGS.	TARSAL JOINTS.
<i>Anopheles Jesoensis</i> , Tsuzuki.	Two large black spots at the front margin (costa) of the wing, one of those at the outer margin, and a few small spots on the wing-field.	White rings (i.e. banded) on the tarsal joints.
<i>Anopheles Formosaensis, I</i> , Tsuzuki.	Four black spots at the front margin of the wing.	No white ring (i.e. not banded) on the tarsal joints.
<i>Anopheles Formosaensis, II</i> , Tsuzuki.	Three black spots at the front margin of the wing.	Small white rings on the tarsal joints.

All these three species have, of course, the common character of *Anopheles*. It is well known, I think, what *Anopheles* is, but let me quote here a few words about the generic distinctions of the genus, according to Giles:—

“Palpi about the length of the Proboscis in both sexes. In the female the palpi are four-jointed, and in the male three-jointed. In the female the palpi are filamentous, and are kept when at rest parallel with the proboscis, forming with it a bundle of three pieces. When the female bites she raises and separates them; and in her the ante-penultimate joint is as long as, or a little longer than, the penultimate and last

joints together. In the male the last two joints of the palpi are short, thick, and olive-shaped. Nape with a crown of scales behind Abdomen villous, but as regards the dorsal and ventral surfaces the villosity wants the scaly covering which is so abundant in the genus *Culex*. Legs very long, terminated by simple or denticulate claws."

Without further comment upon these general distinctions the special morphological peculiarities of these three species of *Anopheles* may be described as follows:

1. ANOPHELES JESOENSIS, TSUZUKI.



The head of a female *Anopheles Jesoensis*.

IN A. PSEUDOOPTICUS.

1. The last tarsal joint of the hinder leg is white.
2. The palpus of the female has three white rings.
3. The eggs are connected at the sides.



The head of a male *Anopheles Jesoensis*,
Tsuuzuki.

This species resembles *A. Pseudopticus*, Grassi, very much. The wings of both species are about the same. In *A. Jesoensis* the femur of the front leg is enlarged near the thigh, just as is the case of *A. Pseudopticus*. In the former species there are white rings on the tarsal joints, but the latter one has no banded tarsus. The exact difference between the two species is as follows:

IN A. JESOENSIS.

1. The last tarsal joint of the hinder leg is just as black as is the case in the other pair of legs.
2. The palpus of the female has no white ring.
3. The eggs are connected at the ends.

This species is found in the whole of Japan (Jeso, Formosa, and Honto, i. e. Japan proper).



Anopheles Jesoensis, female.

We can see two large black spots on the front margin, a small one on the outer margin, and a few on the wing-field. And there are two small spots more or less bright on the front margin, and one on the field. (They appear yellow when examined under a microscope.)

(b) *Microscopical Qualities*:—On all the veins of the wing, we find partly black and partly yellow scales which appear to be black spots when examined with the naked eye.

The first large black spot (counted from the base of the wing) consists of the scales of the costa, auxiliary, and the first and second longitudinal veins. The first yellow spot projects from behind into this first large black spot and reaches the auxiliary vein, but never to the costal vein. The second large black spot consists of the scales of the costal, and the first and second longitudinal veins. And between these first

THE SIZE OF THE BODY:—The length of the body including the Proboscis 8 m.m., the wing 4 m.m. the head 0.7 m.m. in diameter, the breast 1.3 m.m. long, 1.1 m.m. wide, and the belly varies from 0.7 m.m. to 1.3 m.m. The length of the front leg is 9 m.m.; the middle leg 10 m.m.; and the hinder leg is 12 m.m. long.

THE WINGS:—(a) *Macroscopic Qualities*.—We can

see two large black spots on the front margin, a small one on the outer margin, and a few on the wing-field. And there are two small spots more or less bright on the front margin, and one on the field. (They appear yellow when examined under a microscope.)



The Wing of *Anopheles Jesoensis*.

and second large black spots is found the second yellow spot which reaches the costal vein. The small black spot on the outer margin of the wing consists of the scales of the costal, the first longitudinal, and the front branch of the second longitudinal vein. Between this spot and the second large black spot is located the third yellow spot which reaches the costal vein also. On the other veins are scales partly a little yellow and partly black which are the same as the small spots on the wing-field. The surface of the wing is generally somewhat yellow but near both the large black spots it is blackish. On the outer and hinder margin of the wing, there are scales partly black and partly somewhat yellow.

The front leg, with its claws, of a male
Anopheles Jesoensis.

THE PALPUS:—The palpus of the female is covered with black scales all over, except the tip of the palpus and the connecting points of two joints, and these scales become shorter the nearer they approach the end.

The palpus of the male is covered with black scales from the first to the third joints. The last two joints (the fourth

The claws of middle, and hinder legs of a male, and each leg of a female *Anopheles Jesoensis.*

shaped, and have small brown spots on them. From the end of the third joint to the fourth joint, we can see long brown hairs, and short ones on the fifth joint.

THE BREAST:—The breast is colored brown. There are a few scales on the shoulder and the tip of the shield.

THE BELLY:—The belly is brown, too, and it has small deep-brown spots on its dorsal surface. It has long hairs all over and often a few scales on the last abdominal ring.

THE LEGS:—The femur of the front leg is enlarged in its proximal part. The femur and tibia are brown. The tarsal joint is black in the center, but it is yellow at both ends, that is at the connecting part of two joints; where we can see a white ring or band with the naked eye.

2. *ANOPHELES FORMOSAENSIS* I., TSUZUKI.

This species is like *A. Superpictus*, Grassi, in general respects. The wing and the

A male Anopheles Formosaensis I. palpus are about the same in both species. The different points are as follows:

A. SUPERPICTUS.

- | | |
|---------------------------------------|-------------------------------------|
| 1. The breast has a few scales on it. | <i>A. FORMOSAENSIS</i> I. |
| 2. The tarsus is white-banded. | 1. The breast has no scales at all. |
| | 2. The Tarsus is not white-banded. |

This species is found all over Formosa, especially in the northern part of the island.

THE SIZE OF THE BODY:—

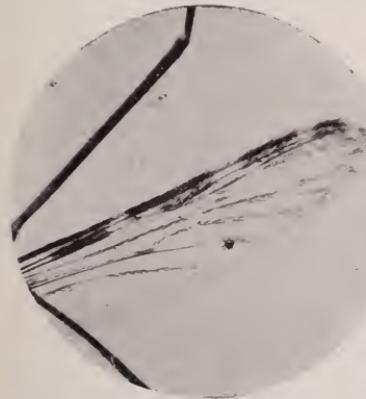
The length of the body is 5.1 m.m., the wing, 3 m.m.; the head 0.6 m.m. in diameter; the breast 1 m.m. long, and 0.17 m.m. wide; the belly varies from 0.5 to 1.1 m.m.; the front leg 6.5 m.m.; the middle leg 8 m.m.; and the hinder leg is 10 m.m. long.

THE WING:—(a) *Macroscopic Qualities.* There are four black spots on the front margin of the wing.



(b) *Microscopical Qualities.*—The first and second black spots consist of the deep black scales of the costal, auxiliary and the first longitudinal veins. The black scales of these two black spots on the costal vein project toward the root of the wing further than those of the two other veins, so that the two black spots have a rectangular shape. The third and fourth black spots consist of the deep black scales of the costal and the first longitudinal veins and have the shape of a rectangular parallelogram. In the three intervals formed by the four black spots are three yellow spots which reach

The head of a female *Anopheles Formosensis*, I.
the front margin of the wing. On the other veins, as well as the outer and hinder margins of the wing are scales partly yellow and partly black. The wing is generally yellowish.



The wing of an *Anopheles Formosensis*, I.



The head of a female *Anopheles Formosensis*, I.

THE PALPUS:—The palpus of the female is covered with black scales from the first to the fourth joint, with the exception of the connecting points of the second and third joints, that of the third and fourth joints, and the end of the fourth joint with the whole fifth joint. These parts which have scales, have the appearance of three white-yellow bands. The last

band is the widest because it contains the end of the fourth joint and the whole fifth joint together.

The palpus of the male is covered with black scales from the first to the third joint. The fourth and the fifth joints

are much enlarged in the center, thus giving an olive shape. On the end of the third joint, there can be seen a white-yellow band, and on the whole fourth joint are long hairs. The fifth joint has short hairs, small brown spots, and a band of scales on its proximal end.



The hinder part of the body of a male *Anopheles Formosaensis*, I. The front leg is a little enlarged near its proximal end. The femur and the tibia of all the legs are brown. The tarsal joint is black and has no yellow band.

3. ANOPHELES FORMOSAENSIS II, TSUZUKI.

This species also resembles *A. Superpictus*, Grassi, very much. They differ from each other as follows:

- | | |
|--|---|
| A. SUPERPICTUS. | A. FORMOSAENSIS, II. |
| 1. The femur of the front leg is not enlarged near its proximal end. | 1. The femur of the front leg is a little enlarged near its proximal end. |
| 2. The wing has four black spots. | 2. The wing has three black spots. |

This species is generally found in the southern part of Formosa.

THE SIZE OF THE BODY:—The length of the body in the female is 5.5 m.m., and 6.3 m.m. in the male; the wing 3.2 m.m.; the breast 1 m.m. long, 0.8 m.m. wide, the head 0.65 m.m. long in diameter, the belly varies from 0.5 to 1.3 m.m., the front leg 6 m.m., the middle leg 7 m.m., and the hinder leg 9 m.m., long.

A female *Anopheles Formosaensis*, I.



THE WING:—(a) *Macroscopical Qualities*.—There are three black spots on the front margin of the wing, and the first one is about twice as large as the two others.

(b) *Microscopical Qualities*.

—The first black spot consists of the deep black scales of the costal, the auxiliary, and the first longitudinal veins. The first yellow spot projects from behind, into the first black spot, thus making a defect at that point, and reaches the auxiliary vein. The second and the third blackspots consist of the deep black scales of the costal, and the first longitudinal veins. In the two intervals formed by the three black spots are the second and third yellow spots, which reach the costa. On the costa, between the root of the wing and the first black spot, can be found one or two more groups of deep black scales. On the other veins as well as on the outer and hinder margin of the wing are found



The head of a male *Anopheles Formosaensis*, I.

scales partly yellow and partly somewhat black. The wing is generally yellow, but near the black spots a little blackish.

THE PALPUS:—The palpus of the female is about the same as that of *A. Formosaensis* I., only the white bands are a little more distinct.

The palpus of the male has one white-yellow band on the connecting point of the second and third joints, otherwise it is quite the same with that of *A. Formosaensis* I.



The head of a female *Anopheles Formosaensis*, I.

THE BREAST:—is brownish, with a few scales.

THE BELLY:—is brown, with small deep brown spots on its dorsal surface, and it has often a few scales on its last abdominal wing.



The wing of an *Anopheles Formosaensis*, II.

four respects: that is,

A. JESOENSIS AND A. FORMOS. II.

1. The black scales of the second longitudinal vein form a part of the large black spots of the wing.
2. All the black scales on the veins have the same intensity of color.
3. The yellow spots on the wing are small.
4. The palpus has no band.

A. JESOENSIS.

1. The tarsal joint is banded.
2. Scales on the shoulder.
3. The first yellow spot does not reach the margin of the wing.

A. FORMOSAENSIS I.

1. The black scales of the second longitudinal vein are wholly independent of the scales forming the large black spots of the wing.
2. The black scales on the costal, auxillary and the first longitudinal veins are of deeper color than those of the other veins.
3. The yellow spots on the wing are large.
4. The palpus has white-yellow bands

A. FORMOSAENSIS II. AND I.

1. The tarsus is not banded.
2. No scales on the shoulder.
3. The first yellow spot reaches the margin of the wing.

Now I think I could show that we have reason to believe these three species of mosquitoes are different from those which are known in other parts of the world. I have brought with me three specimens. I hope any of your authorities will give special examination to these specimens* and determine whether or not they are peculiar to Japan.

*These specimens have been deposited in the U.S. Army Medical Museum.

It must be added that *A. Claviger* and *Anopheles* without the spots on the wings were never found in Japan.

There is a great deal more that might be said regarding these species of *Anopheles* and the experiments which have been made in connection with them. But it would occupy too much of your time and consequently I shall confine myself to a bare enumeration of the successful experiments which have been made to determine problems connected with the relations between these mosquitoes and the transmission of malaria.

The experiments may be summarized as follows:



A male *Culex*, (common mosquito.)



The head of a female *Culex*, (common mosquito.)

1. An experiment which proves that the three species of *Anopheles* above described can transmit malaria from man to man.

2. An experiment which proves that *Plasmodium vivax* can develop in the body of *Anopheles Jesoensis*.

3. An experiment which proves that an infected *Anopheles Jesoensis* can produce malaria by its sting in a quite healthy person.

4. An experiment in which it is proved that *Laverania malariae* can develop in the body of *A. Jesoensis*, and *A. Formosaensis* I and II.

5. The conclusion that the so-called Summer-Autumn fever and tertian fever are found in Japan, but the quartan fever is never seen.

THE POISONOUS POWER OF PLAGUE BACILLUS IN THE EXCREMENTS OF INFECTED INSECTS.

In June 1898, Dr. Okada, then Surgeon Major, was ordered to go to Formosa where there was an epidemic of Plague, and make research regarding the way in which it is transmitted. He made several discoveries, but these are now well known in the world. So I shall speak only about one matter. It is, that the poisonous power of this bacillus is made wonderfully stronger by passing through the bodies of insects. I expect this fact may be known to you, but I desire to emphasize the date when Dr. Okada made this investigation, which was June, 1898, that is, four years ago.

He made an infusion (solution) with distilled water from the paper upon which infected flies had deposited their urine or faeces (excrements), and made a subcutaneous injection of 0.3 cubic c.m. of this solution into the bodies of rats.

The results of his experiment are indicated in the following table:

Exper'm't. & Rat No.	The time from the injection to the death of the animal.	The pathological changes in the body of the animals.	The results.
1st Experiment Rat No. 1 Rat No. 2	15 hours 17 hours	Not distinct " "	Positive "
2nd Experiment Rat No. 3 Rat No. 4	19 hours Healthy	" " —	"
3rd Experiment Rat No. 5 Rat No. 6	25 hours 24 hours	Distinct Not distinct	Positive The plague-bacillus could not be found. Negative.
4th Experiment Rat No. 7 Rat No. 8	20 hours 21 hours	Not distinct A little distinct	Positive "

According to Nuttall, it was after three or four days that rats died after the injection he gave (the solution not having passed through the body of insects). But we see in the above table that the rats died in from only fifteen to twenty-five hours, and the quicker the death, the less distinct the pathological change. Hence comes the conclusion that the poisonous power of the plague-bacillus is made more than twice as strong by passing through the body of insects.

THE PREVENTION OF MALARIA IN FORMOSA.

After the Japan-China War (1894-95), Formosa became a possession of our government and a certain number of our troops are always kept in reserve there. Concerning the health of the troops, we most dread malaria, because it is this disease that makes the number of patients twice and the number of deaths seven times more in Formosa than in Japan proper. So, for several years we have given much attention to the prevention of malaria, but it has been almost in vain, because although the ratio of cases continued yearly to lessen, the proportion of deaths continued to increase.

	The number of patients,	The number of deaths,	Ratio of patients %	Ratio of death %
1897	41,825	267	272,435	1.739
1898	34,752	270	249,394	1.938
1899	29,371	284	221,263	2.189
1900	30,224	272	222,414	2.002

The residue is counted as another patient in this table.

Since last summer a new method of prevention based upon the mosquito-theory was practiced by order of Lieutenant-General Kodama, the Governor of Formosa, and the Minister of War, in accordance with the advice of Dr. Koike, Surgeon General, and the Chief Surgeon of the Medical Bureau of the War Department.

It was begun from the 21st of September last and ended on the 28th February this year, just 161 days. Half the second company, first battalion of infantry at Kirun, Formosa, 115 in number, was employed from the day of their landing at Kirun, and we gave it the name of "Protected troops". This troop was thoroughly provided with means of protection from mosquito bites. They were confined in the casern from half an hour before sunset, to half an hour after sunrise, the casern having been specially made to prevent mosquitoes entering, and they wore gloves and coverings of the head, specially made for that purpose, when on service at night.

The results of these new methods for the prevention of malaria were absolutely good. Another half of the second company (called by us comparison troop) and all the other companies of the battalion (called by us unprotected troop) had a great many malaria patients, but the protected troop had none.

The table of the numbers of patients is as follows:

	Average number of men,	Number of Patients.	Ratio of patients %
Protected troop,	114,49	0	0
Comparison troop,	104,34	34	32.59
Unprotected troop.	646,36	285	44.09

The experiment of Grassi in Italy shows that 5 cases of malaria were observed among 112 persons, and Celli observed 11 cases in 203 persons, but our case shows none in 115 persons.

The news spread rapidly in the whole island and all the troops despatched there became very cautious regarding the bites of mosquitoes. This caution itself gave good results, and the number of patients and deaths decreased distinctly last year, compared with the preceding years.

	Number of Patients	Number of Deaths	Ratio of Patients %	Ratio of Death. %
From 1897 } to 1900 } average	34,043	27,325	242.514	1.947
1901	22,438	14,500	173.211	1.149

Now it is very clear that the prevention of Malaria is secured by guarding against mosquitoes, and we believe that Formosa will become a healthy island within a few years.

HYGIENE OF JAPANESE HOUSES.

As you well know, the construction of a Japanese house is quite different from that of an American house, and the study of Hygiene regarding houses has been specially made in reference to European houses, not in regard to Japanese houses. Such examination was made for the first time by Dr. M. Koike, Surgeon General, and Chief Surgeon of our army; and it was in March, 1893, that is nine years ago, that the results of this investigation were reported in several magazines.

The principal difference between foreign and Japanese houses is the material used for the windows; while that of your houses is glass, that of our houses is paper. So it is very important to compare the hygienical qualities of paper to those of glass.

The results of the examination are as follows:

I. Ventilation in every quadrat meter in an hour.

(Though a slight difference of temperature, inside and outside, and of the speed of wind outside.)

Japanese paper, called Mino (new) 2.41 cubic meter.

" " " (old) 1.83 " "

The common Japanese paper, 1.67 " "

Glass, o

Moreover the texture of paper is such as to admit the air, and prevent in some degree germs from passing through it. This point was determined by counting the number of colonies of Bacteria developed upon the nourishment specially provided, one from the air inside, (that is, passed through paper), another outside.

II. Filtration of paper.

(In one hour and half, 10 Liter air was aspired).

	Bacteria in the air outside.	Bacteria in the air inside.	The differ- ence.		Ratio of Filtr- ation.
Jap. paper, called Mino, (new)	32	5	27	That is	84.4%
Jap. paper, called Mino, (old)	31	6	25	"	71.4%
Jap. common paper.	26	1	25	"	97.0%

And the whole result of his examination is indicated in the following table:

	Thick- ness.	Specific Weight.	Air-passing capacity in every quadrat meter, in one minute.	Ventila- tion.	Filtration.
New Mino paper	m.m. 0.096	0.281	cub.m. 3.4	cub.m. 2.4	% 84.5
Old " "	0.098	0.197	3.3	1.8	71.4
Common paper	0.059	0.380	3.4	1.7	97.1

Thus the air filtrating capacity of Japanese paper is proportional only to the specific weight, but has no relation to thickness, air passing capacity, or ventilation.

For the purpose of filtering air, several air-filtrators (Luft-filters in German) were invented in Europe, among which Müller's is well known. Let us make a comparison with this and paper.

Japan Common Paper	97.06%
New Mino paper	84.46%
Müller's air filtrator (old)	84.37%
Old Mino paper	71.43%
Müller's air-filtrator (new)	50.47%

It is very wonderful that the air-filtering capacity of paper which is used generally in Japan, is superior to that of Müller's air-filtrator which was made after much trouble in Europe. And the price of paper is so cheap that it is almost not to be compared with the air-filtrator.

It is well known that a citizen of Paris inhales 7500 bacteria germs in a day, one of Berlin 5000 of them. We Japanese, the citizens of Tokyo, who live in the air containing three times as much as in Berlin, and twice as much as in Paris, inhale only 2000 bacteria germs in a day, simply because we use paper for the windows of our houses.

The foregoing are the advantages of Japanese paper but it has weak points, just as things have in general. That is the want of transparency and its porousness.

The degree of prevention of light by new paper is about 57%, and that by old is as much as 75%.

The degree of the retention of warmth by paper is only from 2% to 4%.

But these weak points are not very injurious, because of the mode of our architecture and the climate of Japan. The area of windows of the Japanese house is exceedingly large, compared with that of the foreign house; its proportion to the floor being 1:1.8 and its ratio to the volume of air-contents being 1:36, while that of an European house is 1:40.

And the climate in Japan is not so cold, the annual average being over 13°C. in most parts of Japan (south and west from Sendai).

Thus the use of paper in our architecture is just suitable to our climate.

Permit me to conclude with the remark that I have no investigations of my own, the results of which I can submit to you. I only came, in part, for the purpose of making a brief report concerning the investigations of some of the medical staff of the Imperial Army, but, to a greater degree, with the object of meeting you and gaining larger knowledge from you.

RETIREMENTS FOR AGE IN THE ARMY MEDICAL DEPARTMENT.

BY CAPTAIN EDWARD LYMAN MUNSON, A.M., M.D.
ASSISTANT SURGEON IN THE UNITED STATES ARMY.

THE accompanying list, compiled from authentic sources, gives the dates of retirement for age of the present officers of the Medical Department of the Army. The list is corrected to June 30, 1902, at which time 49 vacancies existed in the Corps. Medical officers will probably be interested in this list, the seniors because of the slow rate of promotion afforded to those lower on the army lists with a lessened attractiveness of the service as a whole, and the juniors because by its aid they can gain an approximate idea of the rank they may be able to obtain in the future.

In using the list to determine the time at which any individual may hope to attain the grade of major or higher, it is necessary to consider not only the retirements as listed for age but also the vacancies resulting from death, retirement for other causes than age, resignation and dismissal. This second factor is variable, but may be expected to average up for a term of years in the future about as has been the case in the past. On referring to Army Registers for the year 1894 and since that time, a period of eight years and six months, the writer finds that beside those of his seniors who have retired for age since December 30, 1893, or who would have so retired since that date down to the present time had they not been dropped from the army lists for other causes, the names of 40 medical officers have been struck from the army lists from among the 145 members of the Corps who on January 1, 1894, might be expected to be senior to the writer on June 30, 1902.

A second factor for consideration is obtained by noting the rate of promotion as it existed prior to the reorganization act of Feb. 4, 1901. Referring to the army lists and averag-

ing up the periods during which the present twenty senior medical officers of the Corps serve before promotion to the grade of major, it is found that this was about 18½ years. The total number of assistant surgeons at that time was 125, and there were 67 officers above that grade. The upper grades thus amounted to about 35 per cent of the total. At present, with 240 assistant surgeons and with but 81 officers above that grade, the proportion of senior officers is but 25 per cent. This reduces the rate of promotion for the future by about 28.6 per cent, and increases the average length of service prior to promotion to a majority to about 24 years.

A third factor which enters into the consideration of each individual case is the age of the man himself as compared with the age of his seniors. This is a most important factor and one which will prevent many medical officers from reaching the higher grades. This factor is readily determined from the retirement list. When it is considered that there is a total of but 81 places above the grade of captain, it is evident that these must be passed through rapidly in order to bring their benefits to all in the corps. This rapidity and steadiness of progression depends, however, upon an even graduation in the matter of age. To show how little this obtains, and consequently how little in the way of promotion may be expected by certain officers, a few of the many instances may, without mentioning names be noted. Thus one man is ranked by 136 medical officers younger than himself, another by 119, another by 118, another by 108, still another by 106, several by 103, and so on. One lieutenant, well down the list, retires three years before a junior major.

CHRONOLOGICAL LIST OF RETIREMENTS OF OFFICERS OF THE MEDICAL CORPS, U. S. ARMY, CORRECTED TO JUNE 30, 1902.

	1902	1904
W. H. Forwood, Sept. 7		Calvin DeWitt, May 26.
	1903	Henry S. Kilbourne, Aug. 14
Henry Lippincott, Sept. 22		Justus M. Brown, Dec. 8
Peter J. A. Cleary, Nov. 7		1905
	1904	Alfred C. Girard, July 31
Timothy E. Wilcox ,Apr. 26		Chas. Smart, Sept. 18

	1906	
John D. Hall, March 17		
Henry S. Turrill, Sept. 8		
	1908	
Wm. H. Corbusier, April 10		
Junius L. Powell, May 1		
Philip F. Harvey, Dec. 12		
	1909	
Robert M. O. Reilly, Jan. 14		
	1910	
Chas. B. Byrne, Jan. 28		
Valery Havard, Feb. 18		
Chas. L. Heizmann, April 15		
Marshall W. Wood, June 3		
Edward B. Moseley Oct. 1		
Joseph B. Girard, Dec. 26		
	1912	
Blair D. Taylor, Jan. 15		
John VanR. Hoff, April 11		
Wm. B. Davis, Aug. 5		
Edwin F. Gardner, Aug. 4		
Geo. W. Adair, Dec. 15		
	1913	
Louis A. LaGarde, April 15		
Edward T. Comegys, Oct. 15		
	1914	
Wm. W. Gray, Oct. 2		
W. Fitzhugh Carter, Oct. 25		
	1915	
Louis M. Maus, May 8		
Walter Reed, Sept. 13		
	1916	
Louis W. Crampton, May 8		
Louis Brechemin, May 25		
Harry O. Perley, Nov. 13		
	1917	
Geo. H. Torney, Jan. 1		
Jas. C. Merrill, March 26		
Geo. E. Bushnell, Sept. 10		
	1918	
Henry B. Birmingham, March 15		
William O. Owen, July 6		
Edward C. Carter, July 7		
John M. Banister, Aug. 17		
Rudolph G. Ebert, Aug. 29		
	1918 (continued)	
Wm. C. Gorgas, Oct. 3		
Daniel M. Appel, Oct. 28		
Chas. Richard, Nov. 10		
Robert J. Gibson, Nov. 26		
Wm. J. Wakeman, Dec. 30		
	1919	
Richard W. Johnson, July 15		
Marlborough C. Wyeth, Sept. 16		
	1920	
Wm. Stephenson, March 3		
Wm. H. Arthur, April 1		
Aaron H. Appel, April 3		
Edgar A. Mearns, Sept. 11		
	1921	
Adrian S. Polhemus, Jan. 3		
Wm. L. Kneedler, Jan. 9		
Henry I. Raymond, May 11		
Frank J. Ives, July 19		
Charles M. Gandy, Nov. 6		
	1922	
Guy L. Edie, Jan. 18		
Wm. C. Borden, May 9		
Peter R. Egan, April 26		
Wm. D. Crosby, July 10		
Chas. B. Ewing, July 11		
Wm. P. Kendall, Sept. 10		
Edward R. Morris, Dec. 8		
	1923	
John L. Phillips, April 1		
	1924	
Ogden Rafferty, April 12		
Jefferson R. Kean, June 27		
Chas E. Woodruff, Oct. 2		
	1925	
Philip G. Wales, Oct. 8		
Wm. B. Banister, Oct. 14		
	1926	
Jas. D. Glennan, March 2		
Joseph D. Clarke, Oct. 24		
	1927	
Walter D. McCaw, Feb. 10		
Geo. M. Wells, May 12		
Henry S. T. Harris, Nov. 25		
Paul Shillock, Dec. 4		

1928

- Chas. F. Mason, Feb. 25
 Geo. J. Newgarden, June 25
 Allen M. Smith, June 26
 Geo. D. DeShon, Aug. 5
 Benjamin L. TenEyck, Sept. 7
 Alfred E. Bradley, Nov. 25
 Wm. Roberts, Dec. 23

1929

- Thomas U. Raymond, Feb. 20
 Wm. E. Purviance, April 3
 Paul F. Straub, July 3
 Chas. Willcox, July 21
 Robt. S. Woodson, Aug. 19
 Wm. F. Lippitt, jr., Sept. 16
 Frank R. Keefer, Oct. 10
 Jas. M. Kennedy, Dec. 4

1930

- John S. Kulp, March 6
 Henry D. Snyder, March 30
 Irving M. Rand, June 16
 John A. Murtagh, June 19
 Henry R. Stiles, July 7
 Wm. F. Lewis, Aug. 21
 Jas. R. Church, Oct. 11
 Geo. H. Richardson, Dec. 19

1931

- Henry C. Fisher, May 20
 Merritte W. Ireland, May 31
 Henry A. Shaw, June 3
 Francis A. Winter, June 30
 Euclid B. Frick, July 29
 Charles Y. Brownlee, Aug. 9
 Frederic P. Reynolds, Aug. 10
 Harry M. Hallock, Oct. 14
 Clyde S. Ford, Dec. 20
 Carl R. Darnall, Dec. 25

1932

- Charles Lynch, March 5
 Wm. H. Brooks, May 7.
 Thos. J. Kirkpatrick, June 15.
 Edward F. Geddings, June 22.
 Thos. S. Bratton, Aug. 10.
 Clement C. Whitcomb, Sept. 16
 Wilson D. Davidson, October 2

1932 (continued)

- Wilfrid Turnbull, Nov. 3
 Patrick H. McAndrew, Nov. 26
 Leigh A. Fuller, Nov. 28
 John R. Devereux, Dec. 16
 Edward L. Munson, Dec. 27

1933

- Compton Wilson, March 4
 Jas. L. Bevans, April 29
 Wm. J. Lyster, July 9
 Elbert E. Persons, July 1
 Chas. E. Marrow, Aug. 29
 Champe C. McCulloch, jr., Sept. 10
 Alexander N. Stark, Sept. 15
 Powell C. Fauntleroy, Sept. 21
 Peter C. Field, Nov. 4
 Howard W. Beal, Nov. 26
 Chas. F. Kieffer, Dec. 22

1934

- Henry L. Gilchrist, Jan. 16
 George W. Crabtree, Feb. 4
 Deane C. Howard, March 11
 Thos. L. Rhodes, April 10
 Wm. W. Quinton, May 10
 Douglas D. Duval, June 4
 Geo. A. Skinner, June 11
 Henry A. Webber, July 9
 Frederick D. Russell, Aug. 17
 Louis T. Hess, Aug. 24
 Henry Page, Sept. 1
 John L. Shepard, Sept. 7
 Henry S. Greenleaf, Sept. 15
 Guy C. M. Godfrey, Oct. 12
 Robt. E. Noble, Nov. 5
 Eugene H. Hartnett, Nov. 22
 Ira H. Shimer, Dec. 1
 Ernest L. Ruffner, Dec. 10
 Samuel M. Waterhouse, Dec. 11
 Wm. H. Wilson, Dec. 25

1935

- Jas. F. Edwards, Jan. 10
 Francis M. C. Usher, Jan. 28
 Edwin P. Wolfe, March 19
 Jas. W. VanDusen, March 29
 Edmund D. Shortlidge, April 12
 Chas. C. Geer, May 18

1935 (continued)

Weston P. Chamberlain, June 4
 Walter D. Webb, June 15
 Arthur M. Line, June 17
 Albert E. Truby, July 18
 Chas. E. B. Flagg, July 22
 Reuben B. Miller, Aug. 19
 David Baker, Aug. 22
 Jas. S. Wilson, Aug. 24
 Wm. J. Calvert, Oct. 7
 Basil H. Dutcher, Dec. 3
 Christopher C. Collins, Dec. 29
 Clarence J. Manly, Dec. 30

1936

Robert Smart, Jan. 6
 Allie W. Williams, Jan. 28
 Franklin M. Kemp, March 3
 John D. Yost, March 3
 Robert M. Thornburgh, March 13
 Richard P. Strong, March 18
 Edward P. Rockhill, March 27
 Robt. B Grubbs, April 9
 Jere B. Clayton, April 19
 Willard F. Truby, May 2
 Wm. W. Reno, May 10
 Wm. M. Roberts, May 15
 Edwin M. Rich, May 22
 John H. Stone, May 25
 Percy M. Ashburn, July 28
 Frederick A. Dale, Aug. 7
 Walter Cox, Aug. 18
 Elmer A. Dean, Aug. 18
 Chas. N. Barney, Aug. 19
 Gideon McD. Van Poole, Sept. 2
 Irwin W. Patton, Sept. 4
 Geo. P. Heard, Sept. 28
 James M. Phalen, Nov. 26
 Henry S. Kiersted, Dec. 17

1937

Herbert M. Smith, Jan. 7
 Henry H. Rutherford, Febr. 13
 Chandler P. Robbins, Feb. 22
 Jas. H. Ford, Feb. 23
 Wm. R. Eastman, March 5
 Park Howell, April 9

1937 (continued)

Robert N. Winn, June 20
 Bailey K. Ashford, Sept. 18
 Arthur W. Morse, Sept. 25
 John H. Allen, Oct. 20
 Jerome S. Chaffee, Nov. 11
 Edward R. Schreiner, Nov. 13
 Jas. F. Hall, Dec. 1
 Chas. A. Ragan, Dec. 11

1938

Benjamin J. Edger, Jan. 24
 George L. Collins, Feb. 19
 Matthew A. DeLaney, March 6
 Sanford H. Wadhams, March 20
 Wm. L. Keller, March 24
 Paul S. Halloran, March 30
 Lloyd LeR. Krebs, March 31
 Cosam J. Bartlett, May 4
 John J. Reilly, May 11
 Major A. W. Shockley, May 13
 Reynold M. Kerby-Smith, June 14
 Eugene R. Whitmore, June 18
 Llewellyn P. Williamson, June 22
 Verge E. Sweazey, June 28
 Robert H. Pierson, Aug. 13
 Charles F. Morse, Sept. 29
 Geo. W. Matthews, Nov. 14
 Geo. W. Jean, Nov. 22
 Wm. P. Woodall, Nov. 22

1939

Samuel A. Lambert, Feb. 24
 Frederick M. Hartsock, May 13
 Wm. N. Bispham, May 22
 Thomas Devereux, May 24
 Geo. M. Eckwurzel, May 27
 Haywood S. Hansell, June 2
 Frank F. Woodbury, June 10
 Theodore Lamson, June 14
 Theodore C. Lyster, July 10
 Wm. H. Moncrief, Aug. 18
 Paul C. Hutton, Oct. 2
 Walter C. Chidester, Nov. 8
 Cary A. Snoddy, Dec. 26

1940	1941 (continued)
Herbert G. Shaw, March 23	Horace D. Bloombergh, Oct. 27
Chas. W. Farr, May 24	Frank C. Baker, Nov. 9
Carroll D. Buck, June 8	Perry L. Boyer, Nov. 18
Junius C. Gregory, June 14	Clarence H. Connor, Dec. 4
George H. R. Gosman, June 15	
Samuel L. Steer, June 16	1942
Kent Nelson, Aug. 3	Roderic P. O'Conner, Jan. 21
Wm. L. Little, Dec. 26	Jay R. Shook, Jan. 29
	Milton E. Lando, Feb. 16
1941	Will LeR. Pyles, Feb. 23.
Wm. F. Davis, Jan. 24	Chas. C. Billingslea, March 16
Conrad C. Koerper, Feb. 3	Wallace DeWitt, June 1
Louis Brechemin, jr., Feb. 21	Roger Brooke, jr., June 14
Wm. E. Vose, March 11	
Albert B. Henderson, March 22.	1943
Raymond F. Metcalfe, May 27.	Nelson Capen, Jan. 3
Robert U. Patterson, June 16	Wm. M. Smart, June 21
Chas. R. Reynolds, July 28.	Harry S. Purnell, Sept. 2

THE DIFFERENTIAL DIAGNOSIS OF TYPHOID
FEVER IN ITS EARLIEST STAGES,—THE
SUBJECT OF THE ENNO SANDER PRIZE
ESSAYS FOR 1902-1903.

IN casting about for the most desirable subject for the prize essays for the present year, it was determined to take a theme from the domain of military medicine proper. Attention was called by one of the most distinguished members of the Association to the important rôle played by Typhoid in active service and to the special value of greater certainty and precision in its early diagnosis, and that phase of the disease was suggested for especial investigation in competition for the Sander Gold Medal. The peculiar fitness of this subject for investigation was at once recognized, and the announcement of its adoption for the competition of 1902-1903 is made. The Board of Award is particularly qualified to pronounce upon the papers to be submitted, each of its members being eminent as an original investigator and competent authority in military medicine. There will doubtless be an unusually active competition for the prize.

THE RELATION OF PERSONNEL TO BED-CAPACITY IN MILITARY HOSPITALS.

BY CAPTAIN JOHN STEWART KULP,

MEDICAL DEPARTMENT, UNITED STATES ARMY.

IN a land flowing with ink and money, whose motto seems to be 'in time of peace prepare for more peace,' it may seem unprofitable to expend energy upon the subject of this paper. On the other hand we search in vain for another nation which so steadily advanced its frontiers by force of arms, and when war comes, as it will come, there will be no opportunity for a study of statistics. Four years ago 250,000 men were called into the field, presumably to do battle, and yet in the law which gave that army its being, there was no mention of a hospital corps to care for its sick and wounded.

That a relation exists between a certain number of disabled men and the number of those who care for them is axiomatic, but these two numbers do not increase *pari passu*, for although it may require one man to care for one patient, it does not require a thousand men to care for a thousand patients. The personnel needed for the sick in hospitals varies between the least number that can feed, attend and nurse the patients (itself a variable) and the greatest number that can be secured from the source of supply. To an extent, increased personnel means increased efficiency, but the number is limited by the exigencies of the military service, in which men are required for other positions than hospital duty, by the definite number allowed by law, and by the unwarranted outlay attending too great accumulation. An overmanned hospital is usually so at the expense of others less fortunate, and hospitals are proverbially avaricious in regard to men. This paper then is an attempt in the direction of establishing the

definite number of men necessary to man military hospitals of varying sizes, assuming the maintenance of a fairly high

standard of efficiency on the part of the institutions. The administration of all our hospitals seems to be on the same general lines. Some simulate civil institutions and are semi-permanent, as in the case of

general, reserve, post, milita-

ry district or base establishments; while others such as detachment, regimental, brigade, or division hospitals must, theoretically at least, conform to the mobility of the command they serve. In transitional personality of the officer is the most important elimination of of this personal impress by speech will result, in most cases at least, in improvement.

The primary arithmetic states dogmatically that we cannot add cats and apples, and it would seem difficult to add doctors, soldiers, female nurses and native laborers and make the result mean anything. Therefore we find it necessary to divide the personnel into distinct classes, and luckily we can do this more easily in military than in civil hospitals. At the same time we can learn many a lesson in administration from the latter, and the gulf between the work of the military and civil employees is narrower than that between the institutions themselves. Per-



The Units.



B Company of Instruction, Hospital Corps, U.S. Army, San Francisco.



St. Luke's Hospital, New York.

the present period the per-commanding one factor of ance; and an a large degree equation and cific regulati-

haps by bearing in mind the points of difference we can better understand the common conditions.

Civil hospitals occupy buildings especially designed for their purpose, they have a definite bed-capacity and they serve a varied class of patients whose ailments are those usual in that locality. Military institutions often occupy buildings which must be adapted to their use, they must be able to conform to sudden gains or losses of patients and hence often find it necessary to increase their original capacity, at times they must change location, their patients consist of adult males, and ready to command, not peculiarities of service, but to climate and well.

nel differs even

In the one case **Children's Hospital, Adelaide, Australia.** we find civilians of various social stations, whose salaries are graded according to the class of their work.



Roof Garden, New York Post Graduate Hospital.



Kitchen of Presbyterian Hospital, N. Y.

To a large extent their connection with the institution is a permanent one, and their family and business interests are dependant on the character and place of their employment. The form of discipline to which they are accustomed is not military discipline, each possesses the

The personnel more widely. In the one case **Children's Hospital, Adelaide, Australia.** we find civilians of various social stations, whose salaries are graded according to the class of their work. To a large extent their connection with the institution is a permanent one, and their family and business interests are dependant on the character and place of their employment. The form of discipline to which they are accustomed is not military discipline, each possesses the

privilege of seeking other employment whenever he desires, while the professional service is rendered by civil practitioners. The military hospital is usually manned by soldiers who are divided into definite grades, and receive pay not necessarily according to their work, but according to their rank. Their number is limited by the available supply, they are commanded by medical officers, and they are regular members of the military hierarchy. This personnel is an ever-changing one and is *sui generis*.

A distinguished writer has observed that there is but one point where doctors and medical officers meet on common ground, and that is at the patient. The other nineteen-twentieths of the medical officer's work is as different as if he belonged to another profession, his highest duty being the prevention of disease. There is not this difference between the two classes of hospitals for both alike feed, partially clothe, and give professional care to the ailing. With a view of profiting from the experience of some of our most ably administered civil institutions¹ their superintendents were asked the following questions: (a) Bed capacity, (b) average number occupied, (c) officers and their duties, (d) administrative departments and the force attached to each, (e) number of personnel, and (f) opinion as to the relative value of male and female nurses.

The replies are interesting and full of practical suggestions, showing some lines that we may follow with advantage, and others that are better left unexplored. The lesson which is between the lines of almost every answer is the folly of attempting to manage a military institution with a military personnel by adhering too closely to the plan which has been developed for civilians in civil hospitals. An incomplete tabulation of their replies is shown in Table I.

Perhaps we can come nearer an ultimate solution by combining some of these special workers into groups, and

¹According to the National Hospital Record there are 2,076 medical institutions in the United States with about 350,000 beds.

TABLE I.
SHOWING THE PERSONNEL OF VARIOUS CIVIL
HOSPITALS.

		Number of beds
Adelaide (Aus) Childrens	88	
Bellevue of New York	220	
Children's, S. Francisco	589	723
Elizabeth (General)	200	190
German of New York	185	175
Conventer of New York	101	90
Hartford Hospital	39	31
Homeopathic of N. Y.	-	15
House of Relief, N. Y.	39	37
J. H. Wright Memorial	60	50
Manha Creek, projected	200	175
Mount Sinai, N. Y.	-	14
New York Hospital	257	173
Penn Hospital	310	240
Polyclinic of N. Y.	80	51
Postgraduate of N. Y.	196	188
Presbyterian of N. Y.	220	200
Presbyterian of Phila.	244	178
Roosevelt	62	45
S. Lukes, Bethlehem	300	228
S. Lukes' N. Y.	75	65
St. Marks' N. Y.	416	250
St. Vincent's N. Y.	100	10
Willard Parker, N. Y.	-	26
		Average No. Patients
		Doctors resident
		Doctors visiting
		Superintendent
		Asstant Superintendent
		Night Superintendent
		Registrar
		Clerks
		Matrons
		Head nurses, female
		Pharmacists
		Storekeepers
		Chaplains
		Orderlies
		Nurses, female
		Male laborers
		Female laborers
		Cooks
		Laundresses
		Gardeners
		Outside men
		Artificers
		Ambulance drivers
		Engineers
		Firemen
		Seamstresses
		Porters
		Watchmen
		Waiters
		Miscellaneous
		Total personnel

nearly all the civil institutions seem to find the following arrangement to be the most satisfactory.

1. Department of administration:
Superintendent, clerks, and messengers.

2. Dispensary service:

A special personnel only indirectly connected with the hospital.



**Operating Room,
St. Vincent's Hospital, New York.**

7. Medicines:

Pharmacists

8. Nursing:

Female nurses,
nur-
derlies.

9. Outdoor de-
Gardeners,

laborers, ar-
lance drivers,

10. Training
Superintend-

head nurses,
and proba-

3. Department of food supply:

a. Purchase — steward's depart-
ment.

b. Preparation — bakers, butch-
ers, cellarmen, cooks, kitchen
and scullery maids.

c. Serving — dining-room and
pantry maids, waiters.

4. Housekeeper's department:

Laundresses, scrubbers, seam-
stresses and sweepers.

5. Janitor's department:

Doorkeepers, elevator force, elec-
tricians, gatemen, engineers, fur-
nace men, morgue attendant, etc.

6. Medical attendance:

Attending staff, house staff,
pathologist, specialists, orderlies.

and assistants.

es and male or-

partment:
sidewalk m en,
tificers, a m bu-
stablemen, etc.
school for nurses,
ent of nurses,
graduates ,pupils
tioners.



**Graduating Class, German Hospital,
New York.**

Table II is compiled ac-
cording to these departments
and although interesting
contains several unavoidable
sources of error, while
its percentage of sixty-three
persons to care for each
hundred patients is certain-
ly larger than we could
afford in military hospitals.
It should be remembered
however that it is in part



Sterilizing Room, Roosevelt Hospital.

due to the fact that a large attending staff of doctors is necessary, as they can devote but a small portion of their time to this work, and also that the coefficient of ability is very low in regard to much of the unskilled labor. The fact that nearly every civil institution gives regular, systematic and graded instruction to its nursing force (with no additional permanent personnel for this purpose) contains a lesson valuable to every hospital commander.

TABLE II.

THE PROPORTION OF PERSONNEL IN EACH DEPARTMENT OF VARIOUS CIVIL HOSPITALS TO THE WHOLE PERSONNEL.

Department of:—	Total Personnel	Average	Percentage of this department to the whole	Total average personnel to beds
Administration	164	3 $\frac{5}{12}$	.0285	
Food Supply	1474	30 $\frac{3}{4}$	.2559	
Housekeeping	1140	23 $\frac{3}{4}$	.1984	
Janitor	110	2 $\frac{7}{4}$	.0191	
Medic'l attend.	238	4 $\frac{2}{3}$	.0143	.6277
Medical suppl's	50	1 $\frac{1}{2}$	.0087	
Nursing	2460	51 $\frac{1}{4}$	.4270	
Outdoor work	124	2 $\frac{7}{12}$	.0215	
No. of beds	9176	191 $\frac{1}{6}$		
Personnel	5760	120	1.0000	

It is with regard to this nursing force that we meet a rather difficult problem, and one that is still unsolved. In the answers to the last question (opinion as to the relative value of male and female nurses) the forty-seven replies are so varied, and cover so wide a ground, as to render them difficult of classification. The points on which all agree are: (a) female nurses are always preferable for female patients, (b) there is no adequate supply of trained male nurses, and (c) partially trained male nurses, known as orderlies, are indispensable in male wards.

Some of the superintendents enumerate the advantages and disadvantages of each class and the good qualities of the female nurse are her superior education, the cheapness of her labor considering its high standard, her social adaptability, the refinement which her associations produce, her temperance with regard to stimulants, her fairly high moral standard, the cleanliness of herself and her surroundings, and her ex-

cellent habits. The disadvantages are those dependent upon her sex, the fact that in military institutions female labor is more expensive than that of males because of higher pay, separate apartments and better food, and especially because it has thus far been found difficult to properly train hospital corps men when serving with women¹. The question of discipline curiously enough seems harder to solve in military than in civil hospitals, such occurrences as that of the first of last February in Manila being rare in the latter. On hospital ships our experience parallels that of the British service² and for field hospitals proper most medical officers prefer sanitary soldiers.

The hospital corps private is far from perfect, but for his defects, especially in subsequent enlistments, his officers are not without blame. He drinks, his amusements are not refined, his home influences have not been of the best, his language is not always grammatical and as frequently profane, while his contributions to the government, through military channels, are of generous proportions. But his loves are of his life a thing apart, he is seldom upon the sick report except for cause, and if his detachment commander gives him half the training his brother of the line receives, and does not go too wide of the Golden Rule, he will not be found wanting in time of trial. The female nurse cannot be used in military hospitals without having her labor supplemented by that of the sanitary soldier, her services cannot be utilized at all in battle, on the march, or even on the tented field,³ but in large base hospitals she will always be an important factor,⁴ and

¹"Trained male and female nurses do not work together harmoniously, that is, so far as my experience has led me to believe."—Jessie A. Stowers, Supervising Nurse, Gouverneur Hospital, New York.

²"In addition to the male nurses there were four female nurses on board" (the Maine) "but they were found to be entirely out of place."—Medical Record, 14th July, 1900, pg. 79.

³"So far as the sick were concerned there were two plagues in South Africa—the plague of flies and the plague of women."—Treves in British Medical Journal.

⁴Major Valery Havard, Chief Surgeon of the Department of Cuba, reports that, despite the wisest regulations, female nurses will now and then, perhaps without any fault of theirs, be a troublesome and demoralizing factor at posts. He believes that it is in the interest of the service to employ them only at large, important hospitals, never less than two or three together.—Army and Navy Register.

in sudden emergencies female nurses can always be obtained in adequate numbers, when time does not permit men to receive the training without which they are useless. The intelligent, upright and well-instructed sanitary soldier is becoming more and more in evidence, and upon this trained nurse of the hospital corps—useful wherever the exigencies of war may call him—depends at the last the comfort and the safety of the wounded soldier.

Space does not permit of a comparison in detail between the specialized workers of the various departments of the civil and military hospitals, interesting as the subject is. There is no department that will not repay careful study and investigation, and this is particularly true in relation to questions of supply, administration, and records.

Before proceeding to discuss the subdivisions of the personnel of modern military hospitals, it may be well to state that what follows is merely the personal opinion of the writer, based upon his own observation and experience. If in carrying out the idea of decentralization, autonomous divisions and military administration he is not in accord with some other workers in the same field, it is because he has seen this system succeed where another failed. He has been accused of making the patient exist for the hospital, rather than vice versa, and of rotating the personnel so frequently that, in the implied confusion a clinical thermometer was used on a horse and a curry-comb on a patient, but the principle that a sanitary soldier needs experience and responsibility in the various details of his duty is none the less true. The ideal unit of personnel is the trained private of the hospital corps, and until we are given more time in our companies of instruction, this training must be principally received in military hospitals, and even there can be accomplished only by regular (but not too frequent) rotation from one department to another. Dividing the personnel then into different divisions, each having a responsible head, and each capable of indefinite expansion on the one hand, or consisting of but a single person on the other, we may arrange the working force of a military hospital as follows:

1. ADMINISTRATION AND RECORDS:
 - a. Commanding Officer, executive officer, officer-of-the-day, registrar.
 - b. Clerks, orderlies, librarian, printers, buglers, mail clerk, etc.
2. GUARD:
Under the immediate command of the executive officer and detailed without extra personnel.
3. INSTRUCTION:
Officer-in-charge, drill sergeant and clerk. (In addition to their other duties).
4. NIGHT SERVICE:
Night superintendent, nurses, admission and entry clerk, night cook and police. (The work of this department is but seldom properly systematized. In the tropics much of the outdoor police can be done at night).
5. PROFESSIONAL ATTENDANCE:
Operator, pathologist, specialists, and ward surgeons.
Pharmacists, ward masters and nurses.
6. RESERVE PERSONNEL:
Absent-without-leave, emergency details, furlough, pass, sick, special duty, etc.
7. SUPERINTENDENT'S DEPARTMENT:
 - a. Dining service.
 - b. Heat and light.
 - c. Indoor police.
 - d. Kitchen:
Cooks for ration for patients, 40 cent fund (form 69), diets, ration for hospital corps, mess for female nurses, kitchen helpers, etc.
 - e. Linen division:
Laundry force, linen exchange clerk, seamstresses.
 - f. Provost sergeant's division:
Outdoor police, artificers, crematory men.
8. SUPPLY DEPARTMENT:
 - a. Commissary, quartermaster, and ordnance officers, medical store-keeper.
 - b. Clerks in charge of baggage, commissary, medical, ordnance and quartermaster's storehouses.
9. TRANSPORTATION DEPARTMENT:
 - a. Stable boss or wagon master.
 - b. Ambulance drivers, drivers, hostlers.
 - c. Emergency litter squad.

In order that these places may be filled there should be a fixed number of men allotted to each hospital, depending on

its bed-capacity, and in this connection statistics of a few military hospitals may be of interest (table III), although in most cases the number of personnel was not that needed but all that could be spared, and the number of patients is purposely omitted.

TABLE III.

NAME OF HOSPITAL.

	Beds	Officers	Noncommissioned	Privates	Female nurses	Civilians, white	Civilians, native	Date	Total personnel	Percentage
First Reserve, Manila,	1200	14	9	180	50	6	124	19 Jan., '01	388	.319
¹ Compilation of S. G. O.,	1000	33	44	176	-	-	-	July, '01	253	.253
" "	900	30	40	160	-	-	-	July, '01	230	.255
" "	800	27	36	144	-	-	-	July, '01	207	.259
" "	700	24	32	128	-	-	-	July, '01	184	.263
Presidio General,	658	413	16	135	31	17	-	31 Aug., '02	212	.322
Compilation of S. G. O.,	600	21	28	112	-	-	-	July, '01	161	.268
Santa Mesa, Manila,	560	7	4	92	22	6	77	Jan., '00	208	.371
Compilation of S. G. O.,	500	18	24	96	-	-	-	July, '01	138	.276
" "	400	15	20	86	-	-	-	July, '01	115	.288
³ First Reserve, Manila,	363	6	8	81	27	-	46	24 Feb., '01	169	.468
Santa Mesa, Manila,	360	6	7	73	26	-	57	24 Feb., '01	170	.472
Second Reserve, Manila,	327	4	5	55	9	1	24	19 Jan., '00	98	.299
Compilation of S. G. O.,	300	12	16	64	-	-	-	July, '01	92	.307
² Supplementary Wards,	263	4	4	40	1	1	9	19 Jan., '00	59	.224
Corregidor,	220	3	4	39	6	-	23	19 Jan., '00	75	.341
³ Hospital 3, Manila,	200	5	10	50	-	-	11	24 Feb., '01	77	.385
Second Reserve, Manila,	200	5	6	46	16	-	22	24 Feb., '01	95	.475
Fort Bayard, N. M.,	200	43	5	25	8	30	-	31 Aug., '01	71	.355
Divisional Field Hospital,	200	6	9	90	-	-	-	May, '98	105	.320
Compilation of S. G. O.,	200	9	7	48	-	-	-	July, '01	64	.320
Corregidor,	145	3	5	32	6	-	13	24 Feb., '01	59	.407
Hot Springs, Ark.,	122	42	3	19	-	9	-	31 Aug., '02	33	.270
Compilation of S. G. O.,	100	6	8	32	-	-	-	July, '01	46	.460
Washington Barracks,	50	4	4	31	-	2	-	31 Aug., '01	41	.820
Totals,	10366	280	345	2128	202	72	406		3345	.322

¹Compiled from a summary of replies to a circular letter.

²Including guard.

³Line officer acting as commissary and quartermaster.

⁴Including contract surgeons.

In the British service the allowance for station hospitals is a fixed one, with additions according to the number of beds occupied.

	beds	med.	offs.	Q. M.	n. c. o.	pvt.	civs.	total
Station Hospital.....	100	4		1		12	28	0 45
Field Hospital.....	100	4		1		16	23	17 61
Hospital Ship.....	200	5		1		11	29	16 62
General Hospital.....	520	20		1		28	117	11 177

The French have business-like and systematic regulations governing their hospitals, and the following examples

give a general idea of the theoretical number of personnel, supposing eighty per cent of the beds to be usually occupied, and the proportion of sick officers, noncommissioned officers, and privates to be 1, 4 and 15 respectively.

	med.	adm.	phar-	beds	offs.	offs.	ma-	n. c. o.	pvt.	total
			eists							
Hôpital de Givet.....	100	1	2	1	5				37	46
Hôpital de Bordeaux.....	206	6	5	2	11				84	108
Hôpital de Belfort*.....	338	5	3	1	17				98	124
Hôpital de Toulouse*.....	422	5	4	3	21				90	122
Hôpital de Lille.....	500	4	4	2	25				117	152
Hôpital de St. Martin.....	601	11	6	3	30				150	200
Val de Grace.....	1137	22	6	3	57				265	353

*Belfort is a hospital of the second and Toulouse of the third class.

It can be seen how large a proportion of officers the French use for administrative purposes, and their plan of dividing their department along professional, administrative and supply lines is certainly in the direction of increased efficiency.

TABLE IV.
ALLOWANCE OF PERSONNEL IN OTHER FOREIGN SERVICES.

	Medical Officers,	Administrative Offs.,	Apothecaries,	Noncom. Officers,	Privates,	Civilians,	Number of Beds,
Austria-Hungary,	10	8	4	—	200	100	600
Belgium,	6	—	—	—	38	—	50
Frenchfield hosp.,	7	3	—	27	113	8	100
Germany,	5	1	2	8	32	8	200
Italy,	7	1	—	12	40	11	200
Japan,	1	1	3	14	35	2	120
Mexico,	7	2	2	21	138	—	?
Norway,	3	—	1	8	9	9	50
Portugal,	4	1	1	15	28	—	100
Roumania,	52	—	—	119	166	—	?
Russia,	5	3	—	4	103	—	210
Sweden,	9	—	1	13	47	—	150

A bad rule as well as a good one may work both ways, and our own plan whereby an officer prepares for administrative work by a career of professional activity, and ceases his strictly professional service at the time when by reason of

riple experience it has become of most value, cannot be defended. American military attaches, consuls and even ministers are often unable to utter a word in the language of the lands to which they are accredited, and when we take a man from one profession and place him at the head of another, it is well that we are so easily satisfied with the results obtained. Just as it is axiomatic that only medical officers can administer properly the affairs of the medical department, it is equally true that medical officers especially trained along these lines can administer them best.

The personnel of a military hospital may be roughly divided into officers and men. The proportion of officers to patients varies greatly. On the one hand we hear the chief surgeon of a division of militia lament because he had "98 patients in the hospital and only 7 surgeons"¹ on the other hand there was one hospital of nearly three-hundred sick and but three medical officers. The following list of some of the larger colonial hospitals (January, 1901) shows how few could be made to serve when compelled by necessity.

HOSPITAL:	Santa Mesa,	1st Reserve,	Dagupan,	Hospital 2,	Corregidor,	Relief,	2nd Reserve,	Illoilo,	Calamba,	Santa Cruz,	Appari Dist.,	Vigan,	Cebu,
Beds	680	375	290	287	220	220	200	175	160	100	100	100	90
Officers	7	6	5	5	3	4	6	5	2	3	2	2	3
No. beds to each officer.	97	63	58	57	73	55	36	35	80	33	50	50	30

The late Colonel Pope laid down the rule² that there should be a major to each 200 beds, and an officer of less rank to every forty. The French have, as we have seen, in the Val de Grace 1:40, and in the others quoted 1:36, 1:62, 1:47, 1:42, 1:19 (there is a school connected with the Bordeaux hospital) and 1:33. The consensus of opinion in the replies to the circular letter from the office of the Surgeon General gave an increase of one officer to each thirty-three beds after the first hundred, while in the English hospitals the ratio seems 1:20, 1:20, 1:24, and 1:33. The last case is that of a hospital ship not commanded by the medical department.

¹Proceedings Association Military Surgeons, viii, 163.

²Proceedings Association Military Surgeons, ix, 362.

When it is remembered that the medical officer on ward duty must not only care for his patients, but must perform the duties of officer-of-the-day, render regular reports, perform the routine military duties consequent on his commission, and be responsible for the police of his wards and the efficiency of his personnel, it will be seen that thirty-three patients, or major fraction thereof, is all that should be allotted to one officer. In a hundred-bed hospital a practical allowance is a commanding officer, who can also be operator should he so desire, an executive officer, who is also commissary and quartermaster, and three ward surgeons. In a two-hundred bed hospital the commanding officer will have no time for other professional work than that of a consultant, if he keeps properly in touch with the work of his subordinates. The executive officer may be registrar or operator, though this is seldom advisable, and a subaltern of the line may attend to the ordnance, commissary and quartermaster's supplies. These with a complement of six ward surgeons make up a personnel of nine officers, and for each additional hundred beds there should be three ward surgeons.

The allotment of noncommissioned officers should be sufficiently liberal to allow all the important subordinate positions to be filled by them. These in the smaller institutions usually comprise the offices of superintendent, night superintendent, registrar, chief clerk, commissary, ordnance and quartermaster sergeants, pharmacist, medical storekeeper, provost sergeant, mess sergeant, wardmasters, and sergeant of the guard. In the larger hospitals the positions to be filled by noncommissioned officers are more numerous, and it is in these that the absence of corporals is particularly aggravating.

The following table shows the relative proportion of noncommissioned officers to privates in the other branches of our service, exclusive of the noncommissioned staffs.¹

¹It is interesting to note that in the act of March 14, 1777, there were allowed to each 100 sick, 1 steward, 1 matron, 1 hostler, 1 clerk and assistants, 10 nurses and a sufficient guard.

PROPORTION OF NON-COMMISSIONED OFFICERS TO PRIVATES IN OTHER BRANCHES OF THE SERVICE.

	sergeants.	corporals.	privates.	ratio of noncoms. to privates.
Cavalry troop	8	8	57	1:4 $\frac{1}{3}$
Infantry company	8	10	62	1:3 $\frac{1}{9}$
Artillery (field)	9	12	99	1:4 $\frac{1}{2}$
Artillery (coast)	10	12	87	1:3 $\frac{1}{3}$
Engineer company	10	10	84	1:4 $\frac{1}{5}$
	—	—	—	—
	45	52	389 *	1:4

Vide G.O. 48, A.G.O., May 31st, 1902.

This ratio of one noncommissioned officer for every four privates is always advisable, and in an efficient hospital corps comprising 4% of the total strength of an army, there should

TABLE V.

ALLOWANCE OF PERSONNEL FOR MILITARY HOSPITALS ACCORDING TO DEPARTMENTS.

BEDS	ADMINISTRATION AND RECORDS.		NIGHT SERVICE.		PROFESSIONAL ATTENDANCE		RESERVE PERSONNEL,		SUPERINTENDENT'S DEPARTMENT,		SUPPLY DEPARTMENT,		TRANSPORTATION,		TOTAL PERSONNEL,			
	Officers,	Noncommissioned officers, Privates,	Officers,	Noncommissioned Officers, Privates,	Officers,	Noncommissioned Officers, Privates,	Officers,	Noncommissioned Officers, Privates,	Officers,	Noncommissioned Officers, Privates,	Officers,	Noncommissioned Officers, Privates,	Officers,	Noncommissioned Officers, Privates,	Officers,	Noncommissioned Officers, Privates,		
100	1	1	4	0	0	1	4	0	0	2	11	1	1	2	0	0	54	
200	2	2	9	0	0	1	7	4	0	3	19	1	2	4	0	0	90	
300	3	2	12	0	0	1	11	9	0	3	26	1	3	4	0	0	124	
400	2	2	10	0	0	1	13	11	0	2	11	1	4	32	1	1	148	
500	3	3	11	0	1	16	13	12	45	0	2	13	1	4	37	1	3	174
600	3	3	12	1	2	19	15	14	49	0	3	14	1	4	42	1	4	196
700	3	4	13	1	2	21	18	18	52	0	3	16	1	4	49	1	4	221
800	3	4	13	1	2	23	21	22	56	0	4	18	1	4	56	1	5	234
900	3	4	14	1	3	27	24	25	59	0	4	19	1	4	62	1	5	265
1000	4	4	14	1	3	27	26	29	62	0	5	20	1	4	67	1	5	284

be one sergeant major, nine sergeants, and fifteen corporals to every hundred privates. Of these latter forty should be of the first class and sixty of the second, who should not be denominated second class privates but simply privates. Generally speaking there should be two noncommissioned officers to each of the commissioned personnel in this class of work.

Dividing the military personnel of a hospital among its seven principal departments, substituting female nurses for an equal number of first class privates when advisable, and assuming no increase to be necessary for either guard duty or for purposes of instruction, we may state the result as in table V, in which however the details of the separate departments are omitted.

TABLE VI.

ALLOWANCE OF PERSONNEL FOR MILITARY HOSPITALS ACCORDING TO RANK.

	Colonels,	Lieutenant Colonels,	Majors,	Captains,	Lieutenants,	Sergeants Major,	Sergeants,	Corporals,	First Class Privates,	Privates,	Total number,	Percentage of personnel to bed capacity,
100 beds,	0	0	0	1	5	1	2	5	16	24	54	54
200 beds,	0	0	1	2	6	1	3	7	28	42	90	45
300 beds,	0	0	1	3	8	1	5	10	40	56	124	41
400 beds,	0	1	1	4	9	1	7	13	48	64	148	37
500 beds,	0	1	1	5	11	1	9	16	52	78	174	35
600 beds,	1	1	1	5	13	1	11	19	56	88	196	33
700 beds,	1	1	2	6	14	1	13	22	64	97	221	31
800 beds,	1	1	2	7	16	2	15	24	70	106	224	30
900 beds,	1	1	3	8	17	2	17	27	75	114	255	29
1000 beds,	1	1	3	9	19	2	20	29	80	120	284	28

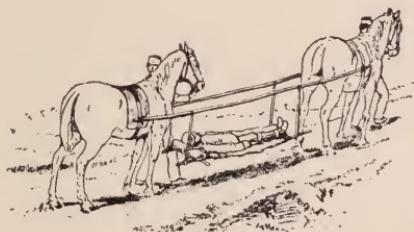
Combining this personnel and dividing it according to the rank of the workers gives table VI, and reducing it to our present archaic condition of a single grade of privates and the various "stewards" produces table VII.

TABLE VII.

RELATION OF PERSONNEL TO BED CAPACITY IN MILITARY HOSPITALS.

Beds	100	200	300	400	500	600	700	800	900	1000
Officers	6	9	12	15	18	21	24	27	30	33
Noncommis's'ed	8	11	16	21	26	31	36	41	46	51
Privates	40	70	96	112	130	144	161	176	189	200

It is a long time since Paine, Lewis and Middleton drafted the bill authorizing our first hospital establishment. Since then every improvement has been made by greater specialization. The days when battles were won, and peace was maintained by 'slight of sword' are past, and the work of the right arm has been superseded by that of the brain. The modern soldier, whether he be of the staff or the line, cannot be skilled in all the details of the art of war, and earnest workers are bringing the results of experience to bear on every class of work. The medical department unites the brain of the laboratory with the hand that lifts the wounded soldier, and no part of its work is unimportant. This is my apology for this paper, for even the relation of personnel to bed-capacity is one of the parts, which taken together, form the great machine for war.



The Sander Prize Essay.

THE MOST PRACTICABLE ORGANIZATION FOR
THE MEDICAL DEPARTMENT OF THE
UNITED STATES ARMY IN
ACTIVE SERVICE.*

BY LIEUTENANT COLONEL VALERY HAVARD,
DEPUTY SURGEON GENERAL IN THE UNITED STATES ARMY.

Part Two.

PRINCIPLES OF FIRST AID ON THE BATTLEFIELD.

OF THE WOUNDS received in recent warfare, more than 90 per cent. (as shown in the Spanish-American, Philippine and South African wars) are made by infantry fire, 5 to 10 per cent. by artillery fire, and only 1 to 2 per cent. by side arms.

28. Intelligent first aid to the wounded, therefore, requires some knowledge of the projectile and of the wound it inflicts. The bullet of the modern military rifle is cylindro-conoidal in shape and consists of a lead core with a hard casing of cupronickel or cupro-nickel steel. It ranges practically point blank up to 600 yards and can inflict a mortal wound beyond two miles. It is characterized by small diameter, lightness, high velocity, long range, flat trajectory and great resistance to deforming violence. It perforates cleanly all soft tissues and spongy bones at all ranges; its destructive effect upon shafts of long bones and organs containing much fluid increases as the range decreases, and within 600 yards may act with explosive violence. Its flat trajectory and velocity render it likely to pass through, or injure several men, often producing multiple wounds on the same man, and seldom remaining in

*Concluded from the August JOURNAL.
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the body at short or middle distances. On the other hand, its long range will often cause the contending lines to open fire when still a mile apart, at which distance it loses much of its striking force and is not unlikely to lodge. That on account of its small diameter and conoidal shape, it may pass through important structures without doing much injury, is often strikingly shown. The track may be quite long but is generally straight from the hole of entrance to that of exit. These holes are quite small and so much alike that often they cannot be distinguished.

29. The feature of these wounds of most importance to the surgeon is that they are aseptic and, if uncomplicated by hemorrhage or fracture, almost always heal within a week or ten days without suppuration; hence the rule that the great majority of them, not fatal within a few hours, are followed by rapid recovery. The chief endeavor of medical officers and hospital corps men, therefore, must be to prevent their becoming infected by contact with hands, instruments or clothing. *Whoever fingers or probes a wound often inflicts a greater injury than the bullet which produced it.*

30. First aid, therefore, in most cases, consists simply in covering the wound with a dry antiseptic dressing so as to prevent it from becoming infected. No water should be used. The first-aid packet contains all the essential articles for the battlefield and its prompt and intelligent application has saved more lives in the recent past and will save more in future than all other forms of primary treatment. The regulation which requires each soldier to carry one first-aid packet is very important and should be strictly enforced. The manner of carrying it should also be clearly defined. It should not be sewed in the blouse which, in warm weather, is likely to be thrown away or lost; the safest place would appear to be on the band of the trousers or, still better, as suggested by Senn, inside the cartridge belt. Every enlisted man should be taught to apply the first-aid dressing not only on his comrades but on his own person, and, in doing so, should be cautioned not to touch the wound with his fingers or his clothing.

If a wound cannot be dressed at once it should be left exposed to the air until assistance comes.

Although every man should understand the application of the first-aid packet so as to help himself or a comrade in time of need, yet it is much better, if skilled assistance be near at hand to wait for it, for much depends upon the way first aid is rendered and the wound dressed; it has even been said, and doubtless with much truth, that "the fate of the wounded rests in the hands of the one who applies the first dressing."

The wounded being thus efficiently protected on the battlefield or at the dressing station, may never need another dressing; at all events, he can generally be safely removed to the field hospital without another examination, provided there are no other reasons to prevent his transportation.

31. Bleeding is the one dangerous condition which requires immediate help; therefore, every man should know how to apply a tourniquet on a comrade, and on himself when possible. For this purpose a handkerchief is the most useful thing and the thoughtful soldier will always carry one about his person. The indiscriminate use of the tourniquet, however, putting it on when uncalled for or using more constriction than necessary, may be productive of much mischief and should be carefully guarded against. The great majority of gunshot wounds do not bleed much; in some the hemorrhage is too rapidly fatal for help (except perhaps by the wounded man himself or his comrade) and in many it will have ceased when aid comes, or become reduced to slight oozing readily stopped by a compress. It will be wise, therefore, for medical officers at the dressing or ambulance stations to loosen tourniquets in order to ascertain if the same degree of constriction, or any at all, is still necessary.

THE LINES OF SURGICAL ASSISTANCE IN OPERATION.

32. It is the opinion of most authorities that, in modern warfare, on account of the quick and murderous fire to which an attacking force is exposed, no relief to the wounded along the line of fire is possible during the heat of the action. To

reach them we must wait for an advance of the troops, a lull in the fight or the close of the battle. Litter bearers on or near the firing line, besides being in the way, make conspicuous targets so that they and their patients are in much greater danger than the combatants, without corresponding advantage to any one. The wounded man lying on the ground has better chances of escaping further injuries than if picked up and placed on a stretcher. It is desirable however that, in each regiment, a medical officer and orderly should be near the line of fire or between it and the dressing station, to give such help as he is able under the circumstances, direct and supervise the litter bearers as soon as they appear, and for such moral effect as his presence may produce.

As the division approaches the enemy and takes the formation of battle, the order is given for all the ambulances detached with regiments to fall out and join the ambulance corps. Only the junior medical officer and orderly of each regiment accompany the troops into action. The acting steward and 2 H.C. privates detached with each regiment (Par. 23) fall out, unite behind the brigade and report for duty at the dressing station.

The chief surgeon determines at which point the ambulance corps is to divide, if at all, into its component companies, each to follow its respective brigade. At this point all ambulances and wagons stop for the present, by the roadside, until dressing stations are located and roads investigated.

Meanwhile, and without delay, each company, under the direction of the 3 medical officers for duty at the dressing station (in addition to those already in front with the regiments) forms rapidly and, with the surgical pack mules (Par. 20), advances to the rear of its corresponding brigade, as near as practicable to the second line (Par. 4). All privates carry the pouch, sling and a full canteen, and each two bearers a folded litter at the carry; in this manner enough litters will be brought to the front for all needs. An acting steward carries a red guidon to mark the dressing station (Par. 238 A.R.).

As the company advances, it attends to all the wounded found on the way; these are collected, as many together as possible, in sheltered places for future removal to the ambulance station, and the necessary attendants left with them. As the firing line becomes thoroughly engaged, the chief surgeon or senior medical officer present, after consulting with the brigade commander if practicable, determines the location of the dressing station. The stewards and nurses quickly prepare it for the reception of patients, cutting off branches, underbrush, improving the approaches, strewing grass on the ground, procuring drinking water, &c.; the packers take down and open the chests.

The litter bearers, under the immediate instructions of all available acting stewards, and the general direction of the junior regimental medical officers, start out from the dressing station to the front as soon as the wounded can be approached and carried off.

33. The commanding officer of each company having inspected his ambulances and wagons (one subsistence and two baggage wagons) takes measures for their immediate advance to the dressing station or as near it as possible, under the immediate direction of the acting assistant quartermaster.

It will generally happen that ambulances cannot reach the dressing stations (Par. 7). The point at which they are obliged to stop will be the AMBULANCE STATION (*Wagen Halteplatz* of the Germans, *Relai d' Ambulance* of the French). To this point all patients from the nearest dressing station or stations (of whatever brigade or division) will be brought. Preparations, therefore, should be made for their reception and care while awaiting transportation. It will be best to put up only one or two hospital tents or flies at first, and more later if found necessary. All needful restoratives are obtained from the subsistence wagon, and medicines and dressings from the ambulance chests. The ambulance station is marked during the day by the red-cross flag and the national flag (Art. VII, Geneva Convention), and during the night by a red light.

34. The regimental officer on duty at the front renders whatever help he is able during the heat of the action and in the intervals of battle. As soon as the litter bearers appear, he directs, encourages and admonishes them, to the end that the wounded may be carried as soon as possible to the dressing station. Dressing wounds under fire is not often practicable nor advisable (Par 32), but in case of severe hemorrhage an effort should always be made to check it. The first duty of the bearers is to carry their patients to a sheltered place; there they can give them water to quench thirst, secure them in the best position on the litter and otherwise prevent their wounds from causing unnecessary suffering while in transit to the dressing station. The arms and accoutrements of each patient should be carried with him to the station; rifles are always examined and, if loaded, the cartridges removed.

After the battle a thorough search is made in woods, ravines, thickets, &c., for wounded men of both sides.

Each patient brought to the station is left upon his litter until a medical officer, after examination, directs how to dispose of him. If no spare litters are at hand, he is unloaded in a suitable place and the bearers, with closed litter, return at once to the front; or he is carried on directly to the ambulance station.

Wounded men almost invariably complain of great thirst and plenty of fresh water should be at hand, if possible. Stimulants must be given very sparingly. The medical officers apply or direct the application of the primary and provisional treatment; they prescribe the administration of restoratives, stimulants and hypodermics; hemorrhage is checked, fractures are secured and all wounds protected antiseptically. It is here that the first-aid packet plays a most important part, its correct application being all the dressing that is required in a large majority of cases. No operations are performed at the dressing station, being deemed impossible there with proper antiseptic measures and therefore without infecting the wounds.

Men dying or desperately wounded should be left at the station, whatever may be the issue of the battle, until they revive or improve sufficiently to justify their removal. After the battle, a section of the field hospital can be set up at the station.

TRANSPORTABLE	Date _____	No. _____	NOT TRANSPORTABLE
	Rank & Name _____		
	Regiment _____		
	Diagnosis _____		
	Treatment _____		
	Urgent _____		
	Amb. Station _____		
	Signature _____		

(Directions on the back.)

DIRECTIONS.

In a simple flesh wound, whether the patient is or is not able to walk, tear off both colored borders, leaving only the white body of the tag; if a man is severely wounded, unable to walk but able to be transported, tear off the **red** border, leaving the **blue**; if a man is desperately wounded and can not be moved without extreme danger to life, tear off the **blue** border, leaving the **red**.

If treatment is strictly antiseptic, write a capital **A** after the entry under *Treatment*.

On *Urgent* line, write what further treatment (not applicable at first dressing station) is deemed urgently required, if any thing.

On *Amb. Station* line, write any additional treatment applied at the ambulance station.

Fasten to clothing of patient (over sternum) with ordinary paper fastener or pin.

Diagnosis Tag Devised by the Writer.

Fifty tags (consecutively numbered) are glued together on the edge so as to be readily detached. The word "transportable" should be on the blue border, and the words "not transportable" on the red border (See Par. 35).

35. The last thing done for the patient at the dressing station is to prepare the diagnosis tag and fasten it to his clothing. The tag with colored borders (first advocated by the writer) possesses such distinct advantages that it imposes itself upon every well ordered field sanitary system. The form recommended is appended hereto. The significance of this tag is as follows:- The removal of both colored borders shows at a glance that the patient is not seriously wounded; the removal of the red, leaving the blue, that he is seriously wounded but able to be transported at once; the removal of the blue, leaving the red, that he is in a desperate condition and should not be moved more than absolutely necessary.*

36. Medical officers must not allow patients to accumulate on their hands at the dressing station but should make use of all available bearers and means of transportation to send them on as quickly as possible to the ambulance station and field hospital. A certain proportion of wounded, from one-fourth to one-half of the total number, will be able to walk to the ambulance station assisted, if need be, by bearers; they should be sent in groups, each, if possible, in charge of a non-commissioned officer. Men with trifling wounds should be ordered back to the front.

After a victorious battle any necessary help to carry off the wounded should be obtained from the regimental commanders.

In case of a forward movement by the troops, the chief surgeon, or commanding officer^{*} of the ambulance corps, directs a corresponding advance of the dressing stations, or, better still, the formation of new stations with unengaged personnel. So far as practicable, medical officers and attend-

*Every soldier on being mobilized for a campaign should, as in European armies, be made to wear, attached to a small chain around the neck, a medallion upon which are engraved his name, regiment, corps and domicile. Without such means of identification a large proportion of the killed will inevitably be buried as "unknown" after a battle of any magnitude. Whoever has seen, like the writer, the solid row of forty "unknown" soldiers buried near where they fell at El Caney, Cuba, fully realizes this fact. The medallion would render unnecessary the filling out of part of the diagnosis tag at the dressing station where time is so precious.

ants at a dressing station should be allowed to complete their work before being transferred to other duties.

In case of a retrograde movement, the wounded are evacuated as quickly as possible, beginning with the less severely hurt; if this evacuation cannot be completed in time and the number of the wounded justifies it, one medical officer and as many hospital corps men as necessary remain with them under the protection of the Geneva Convention.

37. On arriving at the ambulance station the bearers lower the litter to the ground, leaving the patient upon it; they secure another litter and return to the dressing station. The patient, unless there are special reasons to the contrary, should be loaded into the ambulance *upon his own litter*. In this manner he reaches his cot at the field hospital upon the same litter where first laid and without at any time being removed from it.

At the ambulance station, patients are again examined and given such first aid as their condition requires; all whose dressing was properly applied are at once loaded into the ambulances and forwarded to the field hospital. Tourniquets are loosened or removed. Patients with wounds still undressed or badly protected receive special attention. Only such very rare operations as may be immediately required to save life or permit further transportation are admissible at the ambulance station; they should, if possible, be performed under antiseptic. In all patients, the diagnosis tag is verified and completed, or a new one put on. .

38. The site of the field hospital having been selected (Pars. 6, 12, 24), the personnel which accompanied the ambulance corps in advance of the hospital train (Par. 24) prepares the grounds for the tentage, or if buildings are to be occupied, proceeds to clean them and make all necessary dispositions and alterations. One or two messengers should be dispatched to find the train and guide it quickly to the place. The field hospital, like the ambulance station (Par. 33), is marked by the red-cross flag and the national flag during the day, and red lights during the night. As stated before (Par.

6), it will be best to put up only one or two sections at first, and wait until the development of the battle shows whether the remaining section or sections are needed, and if so, where. In case of victory, the latter can be established at the princi-

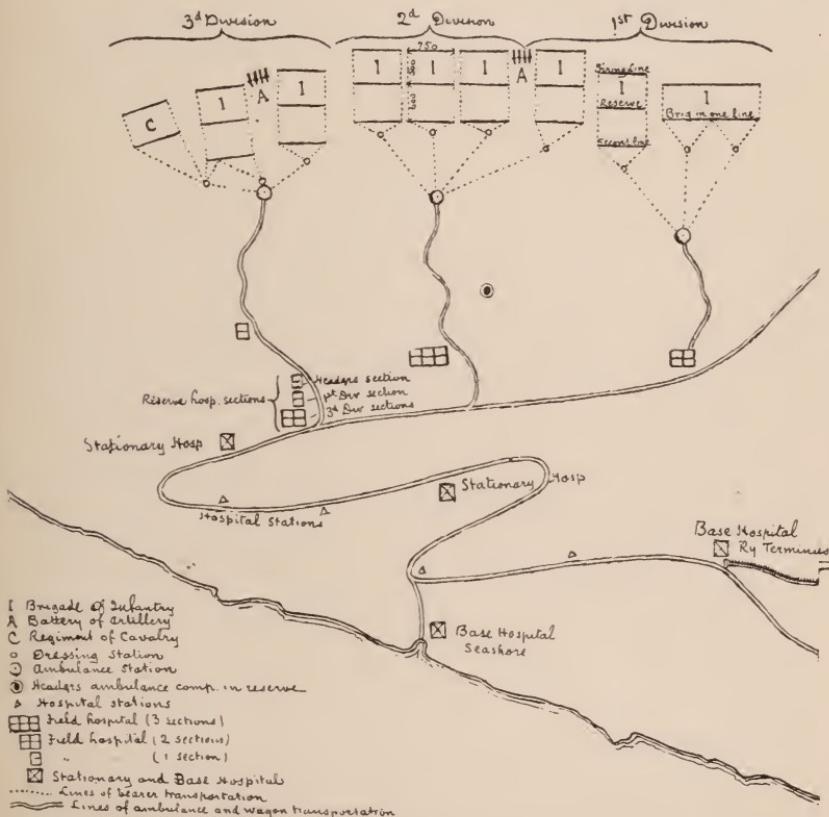


Diagram of an army corps in order of battle, showing firing line, reserve and second line, the three echelons of surgical assistance for the front, and the service of the rear.

pal ambulance or dressing station, thus saving the wounded the pain and danger of unnecessary transportation, while in case of defeat much of the hospital train can be saved by timely retreat, if such a course be deemed advisable. With a civilized enemy, one of the signatory powers to the Geneva Convention, the interest of the wounded, in case of retreat,

can be more carefully considered, and as much of the material and personnel left behind as may be required.*

At least five separate places should be provided at the field hospital, whether in rooms or sheds (if buildings be occupied) or under canvas:

1. For the reception and examination of all patients.
2. For the application of dressings.
3. For operations.
4. For cooking, washing, &c.
5. For wards.

As patients arrive at the hospital, the receiving medical officer distributes them according to the nature and condition of their injuries, as told by the diagnosis tags. If buildings and tents be used, the buildings should first be filled, then section by section of the canvas hospital, so that, in case the latter is not full, one section at least may be ready to move onward with the troops or establish itself at one of the dressing or ambulance stations.

The surgeon and attendants whose duties have ceased at the ambulance stations proceed to the hospital.

It should be clearly understood that, except at the close of a campaign, the field hospital is only a temporary shelter from which all patients are to be discharged or transferred as soon as possible. Men with slight wounds healing by first intention should be sent back to their regiments; all other patients must be evacuated to the rear as soon as they have received proper treatment and are able to be transported.

39. The operations performed at the field hospital are only such as are urgent and could not be safely delayed until after admission to a stationary hospital; they are those demanded by the following injuries:

1. Bleeding wounds, requiring ligation.
2. Bloodlessness, the result of hemorrhage, requiring transfusion of salt solution.

*Under Art. I of the Geneva Convention, as construed by Art. III of the Additional Articles, first-aid stations, ambulance stations and field hospital "shall be protected and respected by belligerents so long as any sick or wounded may be therein."

3. Fracture of the skull with depression, requiring elevation.
4. Shattering of the extremities by shot or shell, requiring amputation.
5. Wounds of the larynx which may require tracheotomy to prevent asphyxia.
6. Wounds of the bladder which may require external urethrotomy if a catheter cannot be introduced.
7. Wounds of the abdomen with prolapse of the intestines. Simple penetrating wounds, even with indications or probabilities of visceral involvement should not be operated on unless the surgeon is an expert, with sufficient time and every reasonable facility for thorough antiseptics.

The surgical wagon contains all necessary appliances for disinfection and sterilization, so that with an adequate and properly trained personnel most of the difficulties special to the field can be overcome.

Diligent care must be exerted to exclude all infectious diseases and to prevent their propagation. The first suspicious cases should be as carefully isolated as circumstances permit. The sterilization of drinking water and the disposal of excreta should receive particular attention (Par. 27). The prevention of malarial and yellow fevers is best effected by the destruction of mosquitoes and the efficient use of mosquito bars.

In a register of sick and wounded, a steward records the name, rank, regiment or corps, injury or sickness and treatment of all patients admitted.

It is difficult, if not impossible, for the regimental surgeon to furnish the list of wounded called for by Par. 887 A.R. The field hospital is the nearest place at which a complete and reliable list can be made and, in my opinion, the above paragraph should be altered accordingly. When patients are sent to stationary or base hospitals, transfer lists should always be forwarded with them.

The commanding officer of the hospital makes requisition

for all medicines, hospital stores and property on the nearest medical depot, and, if so directed by the chief surgeon, supplies the regimental and other medical officers of the division.

SERVICE OF THE REAR.

This service consists essentially of three parts or organisms:

1. The stationary and base hospitals.
2. The evacuation of the sick and disabled away from the field of operations.
3. The forwarding of medical and surgical supplies to the front.

As already stated (Par. 8) a personnel of no less than 1 per cent of the command will be required for this service, outside of the necessary force of quartermaster's transport men for duty as teamsters and crews of steamers and trains. It should be noted that the lines of communication, along which must move the wounded to the base and the medical supplies to the front will probably be that used by a whole corps, if not a whole army, and that there will be a corresponding consolidation of personnel.

Here also (especially at the stationary and base hospitals) may be utilized the volunteer civilian organizations whose co-operation, generally objectionable in front, may be very valuable in rear.

The several parts of the service of the rear, being more or less related and interdependent, will be under the general direction of a lieutenant-colonel or major (medical department), each part being under the immediate command of a major or captain (medical department).

41. Stationary hospitals may be established under canvas or in convenient buildings, and do not differ in all their requirements from civil hospitals except in the temporary nature of their installation and equipment. A train of surgical, subsistence and baggage wagons is assigned to each according to its importance.

The first one should be as near the line of field hospitals as conditions permit, but far enough to be entirely removed

from the scene of conflict. It should also be, if practicable, near a railroad, navigable river or the seashore so that invalided patients may at once be sent to a general hospital. In this first stationary hospital a careful examination and segregation of patients are necessary; those whose wounds are healing by first intention, and likely to be fit for duty within a short time, should be kept until returned to duty. Only those seriously disabled and unlikely to recover within a week or two should be evacuated towards the base.

This hospital should have an isolated annex for the treatment of all cases of contagious diseases sent from the front; such cases must be treated *in situ*, as near the field as possible, so as to avoid the exposure of troops on lines of communication.

If the campaign is closed, or at least if the active movements of the troops are suspended, field hospitals can be immobilized and transformed into stationary hospitals.

42. If the nearest point at which patients can be shipped by boat or rail to their homes or a general hospital is a long distance away, it will be necessary to establish hospital stations along the road, every 15 or 20 miles, where patients can receive every necessary care and those unable to proceed farther can be kept. In a friendly country, civil hospitals may be used for the purpose.

The base hospital is at the point where patients are placed on board ship or trains. It cares for patients until they are able to journey on, or while awaiting transportation.

43. The work of evacuation from the field hospitals to the base requires chiefly a large number of vehicles; ambulances should be used if available, that is, if not needed by the advancing troops in front; but even if used they will not be adequate to the demand after a hard contested battle, especially if the way to the base is long and over difficult country. Besides calling for all the available vehicles of the stationary and base hospitals and of the supply depot, the medical officer in command of the service of the rear will request from the proper authorities that the wagon trains constantly returning

to the base for ammunition, stores, &c., be made to report to the medical officer in charge of the evacuation, at some designated place, so that each wagon may receive a load of patients. One hospital corps man should accompany every 2 or 3 wagons. Each wagon will carry two recumbent patients lying on their litters, but if litters cannot be spared it should be outfitted with such improvised appliances as will insure the greatest measure of comfort and safety to the sick and wounded.

If military ambulances and wagons are not sufficient, the wagons, carts and light spring vehicles of the country can be requisitioned and utilized.

When the great labor of procuring and transporting large numbers of animals is considered, and the added difficulty of feeding them near the theatre of war, it is almost certain that, in future, some form of automobile will play a very important role in the removal of the wounded from the field hospitals.

At the base, all patients who are in condition to proceed further should be at once carried to the hospital train or hospital boat, as the case may be; those who need rest or immediate treatment are admitted to the base hospital.

44. The work of forwarding medical supplies will be effected by means of a general depot at the base, kept constantly replenished by requisitions upon the contractors, and of advanced sub-depots reaching the first stationary hospital and, if possible, the line of field hospitals. To replenish these sub-depots, the depot officer should have under his control an independent train of three or four wagons (more or less according to needs), kept constantly moving, forth and back, between the base and the front and bringing to the base its share of patients. In the absence of such a train it will be necessary to rely upon the quartermaster's department for any transportation it can spare, or else upon the wagons of the stationary and base hospitals.

FOREIGN SERVICE.

45. In the organization of an army corps for foreign service beyond the sea, it is absolutely necessary that the

Medical Department, for the efficient discharge of its duties, should have its own independent ships and the full control of its material and personnel. These ships will be of two classes; hospital ships proper, chiefly intended for the admission and treatment of patients, and hospital train ships for the transport of ambulances, wagons, litters, travois, horses, mules, &c., both classes being fitted out so as best to subserve their purposes, but both carrying reserves of dressings, medicines and hospital stores. They should be provided with all necessary facilities for prompt loading and unloading, including lighters and steam launches, for, as was learned at Santiago in 1898, material in holds of ships is of no value to any one until it is landed.

Each transport should also carry the stores, dressings and medicines needful for the troops on board during the trip, and for about a month afterward, so that in case of accident to the hospital ships the troops may not be left unprovided. It should likewise have a place set apart for dispensary and ward, and another isolated room for infectious diseases. All cases of infectious diseases, as well as others not likely to recover before landing, should be transferred to the hospital ship if within call. If there be no hospital ship available, the transports shall make more adequate provisions for the treatment and isolation of the sick.

46. A base hospital and supply depot must be established at or near the landing place. As the troops advance into the interior, well guarded hospital stations will be set up along the lines of communication.

An important distinction must be made between a civilized enemy, observing the letter and spirit of the Geneva Convention, and an uncivilized enemy not respecting the natural and conventional rights of the wounded and their attendants; with the latter, every precaution has to be taken to prevent the wounded from falling into its hands, and the members of the Hospital Corps should be armed.

47. One of the most important duties of medical officers on foreign service is the clinical study of the diseases most

prevalent in, or special to, the country in which they serve, since the troops will suffer more or less from these same diseases.

Our recent knowledge of the transmission of malarial fever, yellow fever, filariasis and elephantiasis by mosquitoes, robs these diseases of their former gravity and renders them almost entirely preventable.

Very important also is the study of the native means of transportation so that, in case of need, they may be utilized to carry the wounded.

American troops on foreign service soon begin to suffer from nostalgia, often in a rather acute form, incapacitating many men for the proper discharge of their duties; the Medical department can only advise the remedy; to keep the men moderately busy, vary their duties and, above all, to give them the certitude that they shall not remain away from home more than two years.

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NOTE ON THE ORGANIZATION OF THE MEDICAL SERVICE OF THE SWEDISH ARMY.

KAPTEIN Hans Daal of the Norwegian army remarks that recent changes in the medical service of the Swedish army provide that the training school for young men who wish to become military surgeons will hereafter have half-yearly sessions and the curriculum will be materially extended. In every infantry regiment of three battalions and in the larger cavalry regiments there will be three medical officers, a captain and two lieutenants; in the smaller cavalry regiments and in all artillery regiments there will be two medical officers, a captain and a lieutenant. The new organization has added six captains, seven lieutenants and thirteen second lieutenants to the medical corps, making a total of 204 medical officers and 529 enlisted men. The pay is materially increased, especially for captains. A lieutenant colonel will now receive 7000 crowns (\$1876); a major and a senior captain, 6000 crowns (\$1608); a junior captain, 4000 crowns (\$1072); and a lieutenant about 3 000 crowns, (\$804) a year.

Reprints and Translations.

MILITARY MEDICINE AT THE BRITISH MEDICAL ASSOCIATION—1902.

TREATMENT OF WOUNDED IN NAVAL ACTIONS.—After a short address from the President, (Brigade-Surgeon-Lieutenant-Colonel G. S. ELLISTON, M.R.C.S.), Fleet-Surgeon KIRKER (in charge of the course of instruction at Haslar for surgeons on entry) and Staff-Surgeon COLBORNE, of the Naval Medical Department, contributed papers on the Arrangements Desirable on board H. M. Ships for the Treatment of Wounded in Naval Actions. Fleet-Surgeon KIRKER divided the subject for consideration under three heads: (1) The conveyance of the wounded; (2) the time of treatment; (3) the surgeon's station. His ambulance sleigh, of late much improved by a lifting sheet and folding arrangements for the frame, was very much approved by the Section. Dr. Kirker pointed out that the presence or absence of ammunition hoists materially affected the movements of the wounded in action. He also dealt with the possibilities for treatment in action, and deprecated the exposure of the medical officers and their staff to unnecessary danger. The provision of a suitable place for surgical treatment was also treated, and the difficulties of detailing such accommodation pointed out. Hospital ships were discussed and advocated, but he urged provision for treatment on board their own ship, and mentioned such was the case in the German, Russian, and Japanese navies. He advocated from his personal observation the importance of the engine-room staff having their bodies and faces clothed and masked, and thus protected from steam scalding.

Staff-Surgeon COLBORNE divided the subject thus: (1) Preparation in time of peace; (2) conduct during action; (3)

duties after action. The medical officer should make himself thoroughly acquainted with the ship's compartments that could be assigned for the treatment of wounded, and apportion his equipment accordingly. Dressing stations in safety should be arranged and equipped, and splinter-netting screened spaces on deck for the wounded that could not be moved to greater safety. The medical officers should expose themselves to danger as little as possible. In opposition to Dr. Kirker's views, he considered the movement of the seriously wounded to the dressing stations during action was impracticable. After action his recommendations were for the selection of the most suitable accommodation for the treatment of the wounded.

The PRESIDENT (Brigade-Surgeon-Lieutenant-Colonel G. S. ELLISTON, M.R.C.S.) regretted the unavoidable absence of naval medical officers to discuss this important question. The Army Medical Service had been through a severe ordeal during the last two years and eight months, and it might be the turn of the navy in the near future to pass through a similar one. Though hospital ships enjoyed immunity under the Geneva Convention, he feared they might be captured by the victor, but the Chino-Japanese war had indicated their desirability. Inspector-General TURNBULL, mentioned that hospital ships were provided as fleet auxiliaries in 1730, and the arrangements as to their clear deck spaces could not be improved on. Ocean liners in recent years had been speedily and effectively fitted and equipped. The Admiralty left the provision for the arrangements for the wounded in action to the officers in command. Surgeon-Major HUTTON urged the provision of hospital ships as in 1730, and the conserving of the medical officers. He remarked on the non-recognition of the services of the late Director-General of the Army Medical Department. Surgeon-Major POOLE suggested explosions and collisions had not been dealt with, and advocated reform in medical arrangements in the mercantile marine. F. W. Ross, M.D. (London) said that the main point at issue was not whether men-of-war should be efficiently equipped and pro-

vided with surgical stations or depend on hospital ships, but specially as regarded the Kirker ambulance sleigh it was what was wanted for the transport of wounded, naval and military. Fleet Surgeon KIRKER, in Staff-Surgeon Colborne's absence, replied that he fully recognized the necessity for hospital ships, but that the best possible arrangements should be made on board the men-of-war.

PREVENTION OF SCURVY.—Inspector General TURNBULL opened the discussion by maintaining that the Nansen Arctic Expedition of 1893-6 and other late Arctic and Antarctic explorations had demonstrated that lemon juice was not essential as an antiscorbutic. The etiology of scurvy was not yet determined. The experience of the *Dreadnought* Seamen's Hospital supported the efficacy of fresh provisions versus lemon juice as the cause of the diminution of scurvy in later times in the mercantile marine. Professor Torup's theory of a modified ptomaine poisoning being the cause of scurvy might or might not be established, but there could, in Dr. Turnbull's opinion, be no doubt that as purity was the essence of anti-septic surgery, purity of food was the true antiscorbutic. The assertion that scurvy rickets arose from sterilized milk as such was traversed effectively, he considered, by Ransom quoting Holt and Cautley in the *British Medical Journal* of February 22nd, 1902. The PRESIDENT considered that improved victualling and berthing afloat had much to do with the absence of scurvy at present. Fleet-Surgeon KIRKER, Instructor in charge of the course of instruction at Haslar for surgeons on entry, could not agree with the view that scurvy was due to decomposing food. He considered that all evidence indicated it was due to the absence from the diet of fresh organic substances, animal or vegetable. Surgeon-Major HUTTON, J.P., A.M.S., considered it would be difficult to authorize officers in charge of H. M. ships to vary the diet, but thought the absence of scurvy due to the rapid voyages in these days as compared with his early experience of sixty-five days' voyage to the Cape of Good Hope. Colonel DUKE, R.A.M.C., maintained that fresh meat, fruit and veg-

tables were necessary for men, and children. He had seen scorbutic symptoms in children fed on sterilized milk cured by the supply of fresh milk. He believed that scurvy was not due to a ptomaine but to the absence of some substance in fresh meat and vegetables in preserved foods. Inspector-General TURNBULL in reply pointed out in support of his view that the officers in the Nares Expedition sleighing parties suffered little from scurvy, a result attributable to their previous superior dietary and as one officer suggested to him their use of port wine prior to their sleighing, though they consumed their pemmican, which the seamen disliked owing to its unappetizing flavour. The proposed new victualling for the navy was framed for a war diet, when fresh supplies would be unattainable. Under ordinary circumstances seamen varied their diet by local purchase, from canteen or the shore, obtaining payment for rations "saved."

VOLUNTARY AID TO THE SICK AND WOUNDED IN WAR.—Surgeon-Major A. HUTTON, J.P., Organizing Commissioner St. John Ambulance Association, opened the discussion and said that in 1898 it was resolved to form a permanent Central Red Cross Committee for the British Empire and its Dependencies, and to seek official recognition. The committee was composed of representatives of the National Society for Aid to the Sick and Wounded, the St. John Ambulance Association, the Army Nursing Reserve, with War Office representatives, and did much useful, practical work. The St. John Ambulance Association furnished upwards of 2,000 men; 65 died on service, 8 mentioned in despatches. Sir Frederick TREVES noted the difficulty of the orderly question owing to their multifarious duties. The recruiting field, he maintained, was from members of the St. John Ambulance Association, possibly also the volunteer bearer companies. He referred to the terms of service of the R.A.M.C. hospital orderlies. Colonel DUKE, R.A.M.C., advocated two classes of hospital orderlies; dressers at 5s. to 7s. a day and cleaning and other manual labour orderlies eligible for promotion to dressers if fit. St. John Ambulance men required hospital training.

Surgeon-General HAMILTON compared the old regimental soldier orderlies and the trained men of the present day to the advantage of the latter. He concurred with Colonel Duke as to having two classes and the organization of the civil associations to aid the Hospital Orderlies R.A.M.C. Surgeon-Major DARWIN stated his experience of twenty-five years was that the St. John Ambulance men failed to maintain their efficiency after certification from want of practice. Dr. FORBES Ross advocated two classes as Colonel Duke did. Surgeon-Major POOLE stated that two classes were unnecessary in India; native bearers or sweepers would act as the second class. The St. John Ambulance men might maintain efficiency in workhouse infirmaries and some hospitals. Captain William Bridgett PRITCHARD, R.A.M.C. (Vol.) considered the R.A.M.C. (Vol.) the best training ground for hospital orderlies; discipline and training were as essential as ambulance work; they should have nursing training also. Of 200 men in the district 150 volunteered for South Africa; 107 were accepted, but he did not think they had received sufficient recognition. Assistant Commissioner GRIFFITHS (No. 2 West, St. John Ambulance Corps) considered that enthusiasm would thoroughly train St. John Ambulance Corps men as orderlies. That the ambulance brigade movement should be specially encouraged in the dense population of South Wales, where there was excellent material available. The PRESIDENT agreed with Surgeon-Major Hutton and Colonel Duke as to the St. John Ambulance Brigade orderlies, and commented on the valuable work in South Africa of the Volunteers from the brigade bearer companies and the R.A.M.C. (Volunteers). The Secretary of State had recognized the services of the former by incorporating them with the latter.

TREATMENT OF ABDOMINAL WOUNDS IN WAR.—Mr. Charles ROBERTS, Royal Infirmary, Manchester, in opening the discussion treated of the subject under three heads: (1) The nature of the injury; (2) the cases in which operative interference is indicated; (3) to what extent the prospect of success of abdominal operations is diminished by the diffi-

culties inseparable from campaigning. He estimated that from 20 to 30 per cent. of such wounds were not amenable to operation. In the case of increasing intraperitoneal haemorrhage laparotomy was called for; with evidence of perforation of the stomach or bowels operation should not be delayed if environment were favourable. Laparotomy in the wounded in war had proved most unsuccessful, and many recovered without operation. Deputy Inspector-General PORTER, C.B., Royal Hospital, Haslar, made a few observations, mainly concerning the Red Cross Badge.

CONSUMPTION IN THE NAVY.—Surgeon Gerald SICHEL, R.N., Assistant Instructor for the course of instruction for surgeons on entry at the Royal Hospital, Haslar, said there was less consumption in the navy than formerly, and less than in civil life. Yet the disease costs the navy probably £20,000 per annum. The causes in the navy were insufficient ventilation—which was probably unavoidable in men-of-war—exposure to wet and cold, and also to some extent alcoholism. The remedy was to stop the introduction of the disease into such environment by prompt diagnosis and early invaliding. The points to be emphasized were: (1) The routine examination of the sputum furnished the surest means to establish diagnosis, supported by (2) compulsory notification of tuberculosis disease throughout the country which would strengthen the naval medical officer's hand, and he would then feel that in the immediate discharge by invaliding not only the navy but the patient would be benefitted.

POSITION OF THE VOLUNTEER REGIMENTAL MEDICAL OFFICER.—Surgeon-Captain A. E. LARKING (Vol.), said the large number of medical officers resigning after short service indicated that there was something wrong. He advocated the benefit of the regimental medical officer on appointment to make himself acquainted with squad and company drill, stretcher and wagon drill, but no provision was made for this. One consideration tending to make the regimental medical officer unwilling to continue in the volunteers was his position as regards an officer of the combatant ranks. He had no com-

mand, he was looked on as a subaltern, yet had to pay the same amount as the other officers to mess and other funds. His expenses in camp were rarely under £20, irrespective of that arising from the pay of a locum tenens while absent from his practice; for the latter reason their pay should not be 8s. a day, as all other officers, but £1. All regimental medical officers' duties were (1) examination of recruits, (2) training stretcher bearers, (3) camp duty. He suggested that any medical practitioner could perform these duties. In sanitary matters and food inspection the regimental medical officer was rarely consulted. Why not call them R.A.M.C. (Vol.)? Regimental medical officers object to disconnection from their battalions; they wish to go to camp with the battalion and to belong to its mess.

REFORM IN THE ARMY MEDICAL SERVICE.—Surgeon-General Hamilton after recapitulating the steps in the long struggle for the removal of grievances, said his experience of the bad faith of the War Office caused him to await the practical results of the new legislation with anxious interest. The establishment for the corps was not laid down as yet an important omission. The social status of the officers of the R.A. M.C. was still a burning question and there was much ground for improvement.

BRIGADE MEDICAL UNIT.—Brigade-Surgeon Colonel P. B. GILES, V.D., Welsh Border Brigade V.I., Medical Officer Volunteer School of Instruction, read a paper on this subject.

STRETCHER FOR USE ON SHIPBOARD.—Staff Surgeon C. MANSFIELD, H.M.S. *Furious*, showed a stretcher for the movement of wounded on board ship; it has the advantage of being easy to provide on board ship, composed as it is of wood and canvas only.—*British Medical Journal*.

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Brigadier General Robert Maitland O'Reilly, Surgeon General, U.S. Army.

Editorial Department.

SURGEON GENERAL ROBERT MAITLAND O'REILLY,
UNITED STATES ARMY.

ON September seventh Brigadier General Robert Maitland O'Reilly assumed the surgeon generalcy of the army, and his selection meets with general approval. Some months ago it was announced that no one having less than four years to serve would be appointed, and Colonel O'Reilly was the senior officer under this ruling. He is in his thirty-ninth year of service, and has served in every grade from that of acting medical cadet.

The services of our new chief are too well known to require repetition. During the Civil War, while a medical cadet he served in the Army of the Cumberland as an aide to the medical director, and afterwards at various large hospitals. In 1867 while accompanying recruits to San Francisco, via the Isthmus, he was accidentally wounded, and during the years of 1868-9 he was continuously in the field in Arizona, becoming chief surgeon of Upper Arizona when but twenty-four years of age. After serving as chief surgeon of the Sioux Expedition of 1874 he was made post surgeon of Fort D. A. Russell, Wyoming, and this was followed by a tour of eastern service at Forts McHenry and Hamilton. In 1877 he served during the labor strikes in Pennsylvania, soon after which he met with so serious an accident as to disable him for over two years. Returning from sick-leave, he served in Washington until 1889, leaving there for duty at Fort Logan, Colorado, and serving in the Sioux Campaign of 1890-91.

General O'Reilly has always been one of the foremost professional men of the corps, and was selected by President Cleveland as his personal and family physician. Among the

many other prominent cases with which he has been identified was that of General Sheridan, when with C. B. Byrne, Washington Mathews and Yarrow he so conducted the case as to receive the approbation of the entire profession.

Since the beginning of the Spanish-American war his services are well known. He was chief surgeon of the First Independent Division, chief surgeon of the 4th Army Corps, and chief surgeon on the staff of Major General Wade in Havana. Of the various boards on which he served the more important were that for selecting camp sites in the southern states, and that at Havana under instructions from the Secretary of War in October 1898. In December of that year Colonel O'Reilly was sent to Jamaica on the medical department's ship "Bay State" with directions to prepare recommendations relative to the hygiene of the tropics with especial reference to occupation, food and habitation. It is not too much to say that a large part of the success attending the American occupation of the tropics is a logical result of these observations.

Since 1899 he has served as chief surgeon of the Division of Cuba, commanding officer of the Josiah Simpson General Hospital, and chief surgeon of the Department of California. He is an active member of the Association of Military Surgeons of the United States.

The personality of General O'Reilly is marked by dignity and courtesy, and his fifty-seven years rest very lightly upon him. He is physically as well as mentally a strong man, and comes of sturdy pre-revolutionary stock, his family having borne arms for four generations. His devotion to study, extensive travel, and wide acquaintanceship have given him the broad experience so necessary for one in the position he now fills, and the corps is fortunate in having at its head a man able to rise above details. With a chief unafraid of responsibility, zealous for the honor of his corps, tactful and in touch with the leaders of the profession throughout the country, the medical department of the army, rather than General O'Reilly, is to be congratulated on the President's selection.

JOHN STEWART KULP.

Reviews of Books.

ARMY REGULATIONS FOR COMPANY COMMANDERS.*

THIS is a most valuable little book, comprising in convenient pocket form all the regulations pertaining to the conduct of a company, together with reduced facsimiles of all the papers required, and supplemented with an ample index. It may well become the inseparable vade mecum of any officer in command of a company.

DA COSTA'S HEMATOLOGY.†

THE participation of the blood in the causation of disease and the importance of hæmic study in diagnosis have of late years attained such general recognition that a place for a comprehensive work on the subject has become clearly defined. This place Dr. DaCosta's Clinical Hematology amply occupies. The subject is considered in seven sections, beginning with examination of the blood by clinical methods and then taking up in succession the blood as a whole, hemoglobin, erythrocytes, blood plaques and hemoconia; the leukocytes, diseases of the blood, and the anemias of infancy and childhood, closing with a detailed discussion of general hematology which occupies a third of the book. In this portion special diseases are considered in alphabetical order, which greatly facilitates reference. The hematologic

**Company Commander's Manual of Army Regulations*. Compiled by First Lieutenant WILLIAM H. WALDRON, 29th United States Infantry. 12mo. pp. vii, 270. Kansas City, Hudson-Kimberly Publishing Co., 1902.

†*Clinical Hematology. A Practical Guide to the Examination of the Blood with reference to Diagnosis*. By JOHN DACOSTA, Jr., M.D. 8vo, 450 pages. 8 full-page colored plates, 3 charts, and 43 other illustrations. Philadelphia, P. Blakiston's Son & Co., 1902.

phases of disease are discussed comprehensively and with discrimination. In no place does the author's enthusiasm for his subject cause him to attach too much importance to the indications presented by the blood, but an altogether judicial attitude is uniformly maintained.

HEATH'S CLINICAL LECTURES.*

THE appearance of a second series of clinical lectures by Mr. Heath is a subject of congratulation for the profession, for he possesses to an unusual degree the faculty of taking the reader into his confidence in an impressive and attractive manner. The present book, contains seventeen lectures, including the Hunterian Oration for 1897, two Lane lectures delivered in San Francisco on Diseases of the Joints and Aneurysm, a historical address on the surgery of the nineteenth century, and others covering the subjects of ulcers and gangrene of the leg, fractures of the lower limb, common diseases and stricture of the rectum, tetanus, meningoocele and encephalocele, amputation for tubercular joint disease, fracture of the base of the skull, epithelioma and rodent ulcer, distal ligature in the treatment of aneurysm, thyroid cyst, and syphilitic disease of the tongue, —a range of subjects worthy the consideration of the distinguished surgeon whose opinions and experiences are recorded.

MILITARY FIELD MUSIC.†

THIS is a particularly serviceable manual, adapted to all branches of the service where uniformity in the execution of calls is absolutely essential. It will be found especially valuable in many national guard organizations where the services of a competent instructor in field music are not available, and should have a wide circulation.

**Clinical Lectures on Surgical Subjects.* By CHRISTOPHER HEATH. *Second Series.* 12mo. pp. 343. 15 Illustrations. Philadelphia, P. Blakiston's Son & Co, 1902.

†*Trumpeter's Handbook and Instructor.* By WILLIAM S. LITTLETON, Chief Musician of the Fourth United States Cavalry. Published by Authority of the Secretary of War. 24mo. pp. 72. Kansas City, Mo. Hudson-Kimberly Publishing Co., 1902.

THE GENERAL HOSPITAL AND SANATORIUM FOR
THE TREATMENT OF PULMONARY TUBERCU-
LOSSIS AT FORT BAYARD, NEW MEXICO.

By MAJOR DANIEL MITCHELL APPEL,
SURGEON IN THE UNITED STATES ARMY.

GENERAL ORDERS No. 159 of August 29th, 1899, authorized the Surgeon General of the Army to establish a general hospital at Fort Bayard, New Mexico, as a sanatorium for the treatment of officers and enlisted men of the Army suffering from pulmonary tuberculosis. It also authorized him to provide for the care and treatment of discharged soldiers entitled to the benefits of the U. S. Soldiers' Home, Washington, D. C.

The Surgeon General, impressed with the necessity for such a sanatorium, after a personal inspection of the various sites immediately available, selected Fort Bayard, for its admirably suited climate. With his customary foresight he provided for the indefinite period of treatment required in this disease, by enabling discharged soldiers to continue under treatment as beneficiaries of the Soldiers' Home.

The abandonment of Fort Bayard as a military post had long been contemplated and for some years the allotments had been very limited, so that extensive repairs and alterations were urgently required. These were commenced at once and now the Post is in good repair and in excellent sanitary condition, though no new buildings for the accommodation of patients have yet been completed. A glass solarium with steel framework (shown on page 209) which was contracted for in June, 1901, is now nearing completion and will afford excellent protection from the high winds which occasionally prevail, especially during the Spring.

The climate of Fort Bayard permits of comfortable out-

door life during the entire year. During the year 1901 there were 38 rainy days with a total precipitation of 8.94 inches. 198 days were perfectly clear, 151 partly cloudy, and only 16 were wholly cloudy.



Dormitories, formerly used as Barracks.

The mean maximum and minimum temperatures and the precipitation for the past decade are as follows:

MONTH	MEAN MAX.	MEAN MIN.	PRECIPITATION
January	52.81°	24.41°	1892 — 8.89"
February	54.32°	29.85°	1893 — 15.47"
March.....	60.41°	31.12°	1894 — 9.12"
April.....	68.02°	37.31°	1895 — 15.09"
May.....	77.46°	45.95°	1896 — 18.45"
June	86.91°	53.24°	1897 — 18. "
July.....	82.75°	55.56°	1898 — 15.91"
August.....	85.29°	57.53°	1899 — 10.43"
September.....	82.07°	52.27°	1900 — 12.66"
October	70.84°	41.45°	1901 — 8.94"
November	60.70°	32.15°	
December.....	53.75°	25.23°	
General Average.....	69.60°	40.50°	13.34"

In reporting our results from the incipience of the hospital to March 31, 1902, patients discharged are classified ac-



Gymnasium and Crematory.



Fort Bayard, New Mexico. General View.



Infirmary, with Dining Room and Kitchen connected by Open Corridor.

cording to their condition into clinically cured, convalescent, improved, and unimproved. Those in whom all symptoms have disappeared and no reaction follows the tuberculin test are classed as clinically cured, and those who after repeated examination show no bacilli in the sputum and present no evidence of active disease, but still react to tuberculin are classed as convalescent.

In my report to the Surgeon General for the period ending December 31, 1900, patients were divided into three classes representing their *practical division* while under treatment: Class 1, cases afebrile without tubercle bacilli in their sputum; Class 2, cases afebrile with tubercle bacilli in their sputum; and Class 3, cases permanently febrile with tubercle bacilli in the sputum. The first class, those with no bacilli, have separate dormitories, and the third class, with permanent fever, are confined to the infirmary.

For the purpose of graphically representing on a diagrammatic chart the degree of involvement of lung tissue found upon physical examination, cases are divided into three stages: 1st, infiltration; 2nd, consolidation; and 3rd, excavation; corresponding to what are generally known as in-

cipient, moderately advanced, and advanced cases. In this classification is considered only the anatomic character of the involvement, irrespective of its extent or of the area involved.

On the charts on pages 211-212, 214-216 and page 218, infiltration is represented by parallel lines, consolidation by crossed lines and excavation by an outline of the shape and proportionate size of the cavity or cavities as found on physical examination. Emphysema, hypertrophy, atelectasis, pleurisy and other conditions are also indicated on the charts.



Officers' Hospital.

Our patients are thoroughly examined every two months and also in the interim, when the symptoms indicate the existence of some intercurrent trouble.

REPORT OF RESULTS TO MARCH 31, 1902.

Admitted from October 3, 1899 to March 31, 1902.....	623
Of these 55 were readmitted after discharge.	
Remaining under treatment March 31, 1902.....	174
Discharged and died.....	449

In these 449 the results were as follows:

Clinically cured,							7.4%
Convalescent,	"	5	"	21	"	52	11.6%
Improved,	"	5	"	15	"	157	34.9%
Unimproved, including 17 discharged in less							
than one month.....						113	25.2%
Died, including 25 in less than one month.....						94	20.9%



Nurses' Quarters.

RESULT IN THE THREE STAGES.

Stage	Clinically cured	Convalescent	Improved	Unimproved	Died	Total
1st	25	33	75	16	1	150
2nd	7	12	50	38	9	116
3rd	1	7	32	59	84	183
Total	33	52	157	113	94	449

The one death in the first stage was due to tuberculous appendicitis. Of the 9 deaths in the 2nd stage, 5 were from laryngeal or intestinal tuberculosis, 2 from empyema, 1 from

rupture of an aortic aneurism and 1 from acute tuberculous pneumonia.

While, ordinarily, sanatoria for the treatment of pulmonary tuberculosis admit only about 25% of cases examined, as being suitable for admission, one



Solarium, in course of construction, showing the Steel Frame-work.

of the purposes for the establishment of this hospital is to remove all



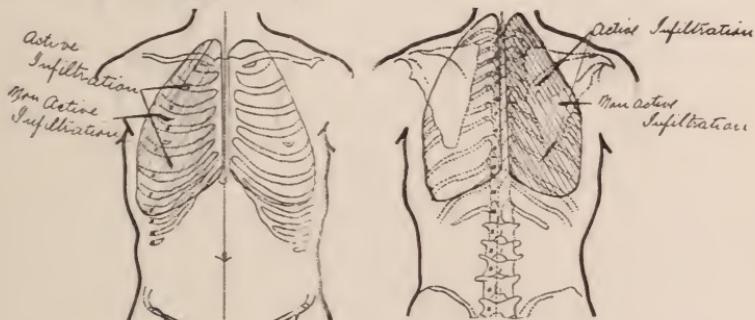
Isolation Cottage for Cases with Excessive Cough.



Dairy and Herd of Milk Cattle.

recognized cases from the wards of general and post hospitals and from the Soldiers' Home at Washington, D. C., to prevent the propagation of the disease. Officers and enlisted men are ordered to the hospital regardless of the stage of the disease or of their desire to come. They are not selected for treatment in a high altitude and doubtless a small minority, even of those in the milder stages, would do better at a lesser altitude. A large majority do not realize the gravity of their affection and the importance of remaining until they are clinically cured. When they feel perfectly comfortable, with no pain or other subjective symptoms, it is usually impossible to make them understand the necessity for remaining longer under the essential restrictions of a sanatorium. In fact, very few Americans, especially of the class to which most of our patients belong, will voluntarily submit to a constant supervision and regulation of every detail of their lives, even to a lesser extent than is in vogue in the German sanatoria. Nearly all

of our patients are discharged on Certificate of Disability in a few months after admission, and though they may continue under treatment indefinitely as beneficiaries of the Soldiers' Home, they cannot be compelled to remain, and many of the most favorable cases, in which there is every reason to expect recovery, leave before such recovery is possible. Quite a number have returned, with their general condition much aggravated and their pulmonary lesion much advanced, which is, of course, to be expected in a disease in which even a single indiscretion may often turn the tide from favorable progress and lead to a fatal result.

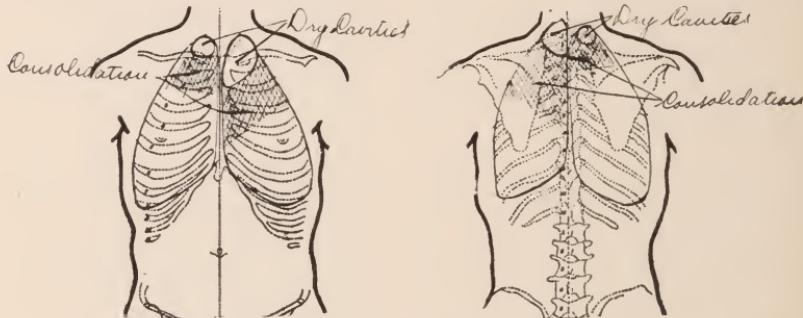


Another factor which militates strongly against more favorable results is that a large majority of our patients have been addicted to the excessive use of alcohol, either occasionally or habitually. Despite all our efforts to prevent it, many succeed in surreptitiously securing a supply of liquor and become intoxicated. These are punished by confinement in the isolation ward of the infirmary, on a diet of bread and milk and usually increase in weight and markedly improve under this enforced rest even with the restricted diet. Though in some cases of tuberculosis moderate doses of alcohol are of benefit in the treatment of certain symptoms, I have found it advisable to absolutely prohibit its use by ambulant patients and our results are much better in those who strictly comply with this rule. We administer it in the form of brandy, whisky, sherry, and port, in moderate doses, only in the infirmary to patients with high fever, and to relieve the extremely distressing debility in far advanced cases.

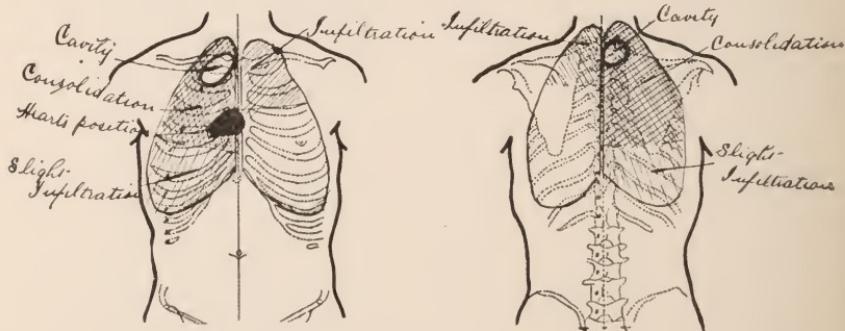
The excessive use of alcohol is an important factor in producing a susceptibility to the disease by lessening tissue re-

sistance, and our therapeutic efforts are directed to the development of this resistance in order to produce a tendency towards fibrosis. My observation has convinced me that in many cases its use retards and even prevents recovery.

That alcohol and tuberculosis are antagonistic was formerly the general belief and is still the opinion of too many.



Nearly 80% of our patients come from the tropics and in many of these, owing to the enervating effects of the tropical climate, the disease has made rapid progress before admission. Others in the milder stages in whom pulmonary tuberculosis followed malaria or dysentery, are very much emaciated on



admission, and their improvement in nutrition and assimilation is often astonishing. Several have increased ten pounds in weight, and one gained twelve pounds in one week.

Patients are weighed every Friday and a report prepared of the gains and losses, if any, in each case.

The following is the Weekly Weight Report of April 4, the first Friday after March 31, 1902.

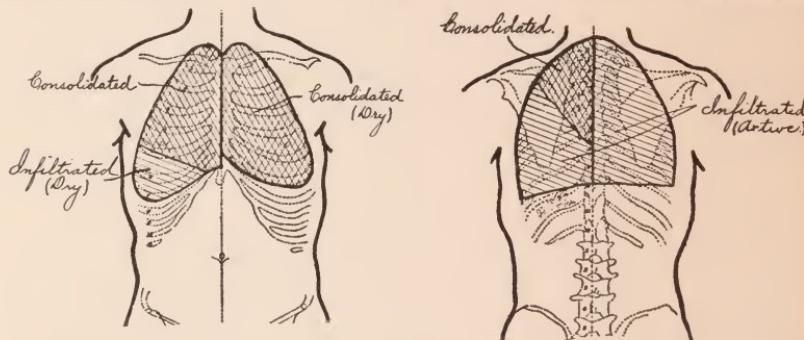
WEEKLY WEIGHT REPORT, APRIL 4, 1902.

NAME.	WEIGHT	GAIN.	LOSS.	NAME.	WEIGHT	GAIN.	LOSS.
Adams.....	117	4		Keefe.....	146	Same	..
Alexander.....	132	..	1	Kehoe.....	111	First	week
Andrews.....	130	3		Kennedy.....	112	Same	..
Bailey.....	141	..	1	Killalie.....	130	2	..
Bardison.....	109	1		King.....	120	1	..
Barry.....	128	First	week	Koehl.....	127	..	3
Bass.....	136	..	2	Krueger.....	139	1	..
Benton.....	133	1		Lippert.....	158	1	..
Black.....	120	1		Long.....	142	2	..
Bowman.....	127	4		Lundgren.....	125	2	..
Brady.....	127	..	2	Lusty.....	101	..	3
Briggs.....	143	..	2	Lyons.....	131	..	4
Bryant.....	155	..	2	McDonough.....	112	..	1
Burch.....	127	..	4	McGovern.....	125	1	..
Burns.....	92	..	2	McMahon.....	116	1	..
Burton.....	90	..	4	Marchessault.....	118	3	..
Cantwell.....	103	1		Martin.....	157	3	..
Carroll, D.....	133	3		Mason.....	128	2	..
Carter, 1st.....	111	1		Mattoon.....	146	..	3
Carter, 2nd.....	123	..	2	Maverick.....	153	3	..
Carr.....	137	1		Mead.....	120	First	week
Case.....	126	1		Miller.....	126	..	2
Cihlar.....	129	1		Moore, E.....	155	..	2
Clifford.....	119	1		Moore, J. F.....	105	Same	..
Collins.....	127	6		Moore, T. W.....	154	..	2
Connell, 1st.....	105	..	3	Nally.....	145	1	..
Connell, 2nd.....	112	Same	..	Naylor.....	117	Same	..
Connor.....	121	Same	..	Neely.....	120	1	..
Cook.....	134	4		Oberauer.....	148	Same	..
Crumby.....	148	..	2	Outten.....	102	..	2
Cummings.....	169	2		Owen.....	139	..	2
Cummins.....	132	Same	..	Perrine.....	152	3	..
Curtis.....	155	..	2	Perry.....	132	..	2
Custance.....	112	..	1	Peter.....	109	1	..
Day.....	102	2		Pirie.....	123	3	..
Dickerson.....	114	..	2	Polly.....	165	1	..
Dorceito.....	135	Same	..	Power.....	120	..	3
Dougherty.....	142	1		Quinn.....	135	3	..
Doughty.....	130	..	1	Reeger.....	128	..	2
Downs.....	144	Same	..	Richard.....	127	Same	..
Dristin.....	146	Same	..	Ross.....	153	5	..
Duffy.....	133	4		Rowland.....	129	..	1
Dutton.....	134	Same	..	Roberts.....	108	Same	..
Ellis.....	128	1		Russell.....	129	2	..
Ellimore.....	139	Same	..	Ryan.....	147	4	..
Fay.....	136	..	3	Rymill.....	136	6	..
Fisher.....	118	..	1	Ryon.....	122	1	..
Flaig.....	118	1		Scannell.....	132	2	..
Forsberg.....	132	1		Schildt.....	123	Same	..
Fowler.....	142	Same	..	Seigel.....	125	1	..
Freckman.....	125	First	week	Sharon.....	134	..	2
Fry.....	146	Same	..	Sheehan.....	119	..	1
Fuhrman.....	137	2		Slater.....	148	..	2
Gallagher.....	117	2		Smith, F.....	131	..	1
Garrison.....	135	2		Smith, O. W.....	145	..	1
Gaston.....	153	..	1	Smith, L. G.....	137	..	3
Gettys.....	141	..	3	Stastney.....	124	3	..
Ginnow.....	117	1		Sullivan.....	97	Same	..
Girard.....	125	Same	..	Tate.....	120	1	..
Graham.....	128	Same	..	Tayman.....	126	Same	..
Green.....	137	Same	..	Thompson.....	143	Same	..
Gross.....	141	..	3	Tolliver.....	164	1	..
Guedry.....	139	1		Van Horne.....	150	..	1
Guest.....	138	1		Vetters.....	143	2	..
Hale.....	165	..	1	Walk.....	151	..	2
Hansborough.....	126	3		Walker.....	139	Same	..
Harding.....	135	Same	..	Warden.....	140	Same	..
Hardy.....	164	..	1	Weinhart.....	117	2	..
Hayes.....	121	Same	..	Welcher.....	123	2	..
Haynes.....	131	..	4	Whalen.....	110	1	..
Hearon.....	132	2		Wheeler.....	112	..	1
Helmbold.....	95	..	2	Williams, 1st.....	134	2	..
Hendry.....	123	..	1	Williams, 2nd.....	133	1	..
Hipp.....	141	1		Wilson, 1st.....	115	1	..
Hodnett.....	112	Same	..	Wilson, 2nd.....	107	First	week
Hoggard.....	161	1		Writesman.....	126	1	..
Howe.....	120	2		Young.....	131	..	1
Jackson.....	137	Same	..	Zillman.....	110	..	2
Jacobson.....	141	Same	..			Gain.....	75
Jennings.....	128	2				Loss.....	48
Karol.....	126	me				No change....	32
Keating.....	147	3					

In many cases in which the weight has gradually increased this increase is not uniform, but shows a marked fluctuation until the maximum is reached, when it generally remains practically permanent, indicating that the improved nutrition has been maintained. This fluctuation is particularly noticeable in the aggregates of the weekly reports, as observed in the following table of fourteen successive weeks:

AGGREGATES OF WEEKLY WEIGHT REPORTS.

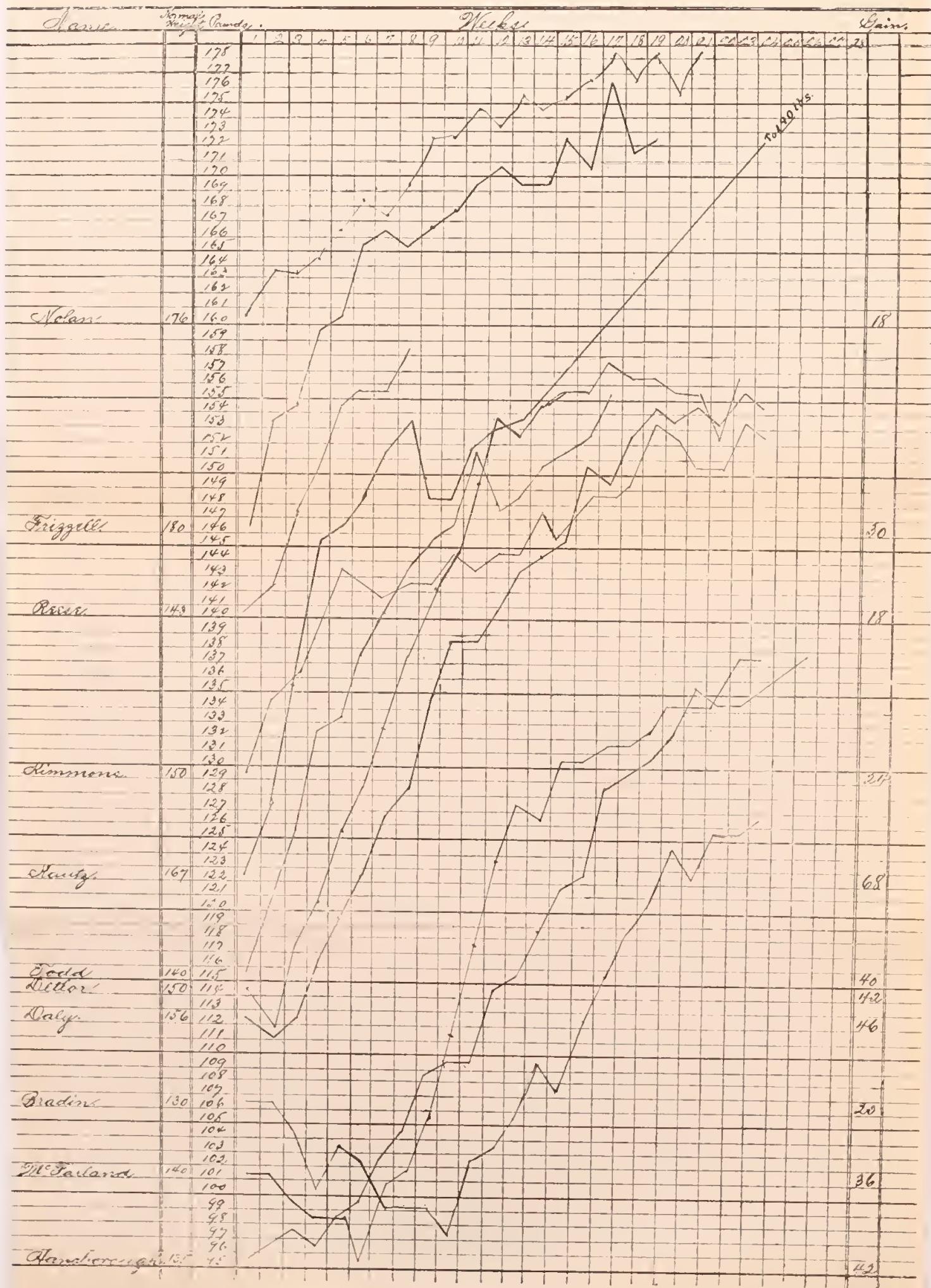
	Gained	Lost	No Change
September 27, 1901.....	63	61	37
October 4, 1901	76	48	39
October 11, 1901	87	45	39
October 18, 1901	71	64	35
October 25, 1901	100	48	31
November 1, 1901.....	60	77	45
November 8, 1901.....	75	58	40
November 15, 1901.....	96	35	33
November 22, 1901.....	54	80	32
November 29, 1901.....	81	65	28
December 6, 1901.....	66	62	37
December 13, 1901.....	47	62	43
December 20, 1901.....	69	57	27
December 27, 1901.....	56	62	40



The chart of weights opposite shows the more or less rapid weekly increase to the normal weight and above in individual cases, which on admission presented various degrees of emaciation.

A large majority of our patients on admission are feeble, emaciated and sallow, and in a few months present a complete physical change and have the appearance of perfect health. Taken as a whole our ambulant patients look healthier than any similar body of men ordinarily seen in an assemblage of equal size.

Chart of Comparative Increase of Weights.





The following is a table of comparative weights on discharge of those who have improved:

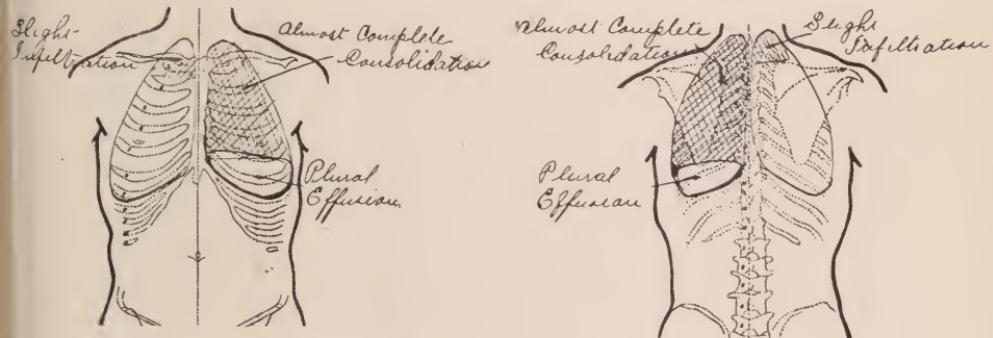
	Discharged	Gained	Average gain lbs.	Lost	Average loss lbs.	No change
Improved,	157	125	10 $\frac{1}{3}$	23	5 $\frac{1}{3}$	9
Convalescent,	52	46	12 $\frac{2}{3}$	4	5	2
Clinically cured,	33	28	15 $\frac{5}{8}$	5	5 $\frac{3}{5}$	

In those discharged improved the three largest gains were 58, 43, and 42 lbs.

In those discharged convalescent the three largest gains were 45, 42, and 40 lbs.

In those discharged clinically cured the three largest gains were 76, 38, and 38 lbs.

Abundant good nutritious food is furnished and the necessity of eating as much as can be digested, regardless of appetite, is impressed upon the patients. I believe three full

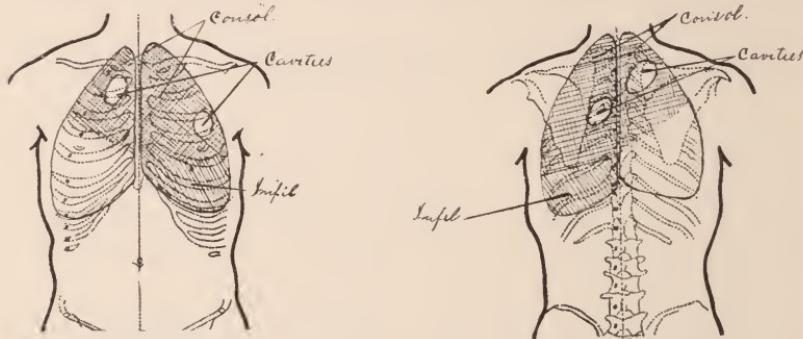


meals a day preferable to more frequent feeding, affording time for more complete digestion between meals.

To prevent eating too rapidly and bolting the food (so common among soldiers), it was found necessary to direct that ambulant patients must remain in the dining room for at least twenty minutes during each meal. Those who cannot eat sufficiently at the regular meals are given milk and raw eggs between meals.

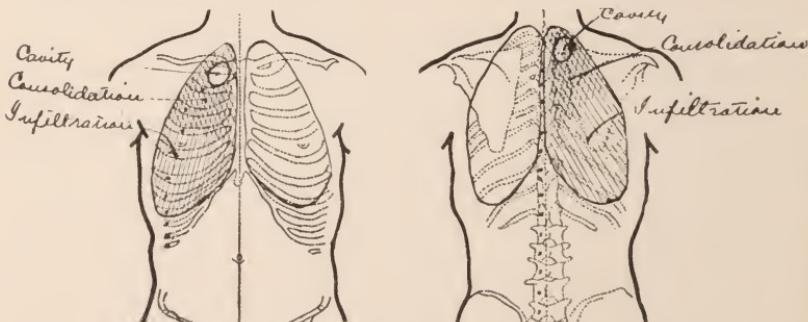
A very common error in the treatment of pulmonary tuberculosis especially in high altitudes, is in the insistence on exercise. Absolute rest, both mental and physical, while the disease is active, should be the rule. Many patients are sent to high altitudes, where the frequency of respiration is at first always increased, with instructions to "live on a ranch and

'rough it.'" Though in rare cases they may improve in spite of the violent exercise, as a rule their condition will become aggravated and until the lungs become accustomed to the rarefied atmosphere, all exercise should be interdicted. After a varying length of time, the fever and rapid pulse having sub-



sided, walking to an extent short of producing fatigue or a recurrence of temperature is permitted. Undue exertion will undoubtedly produce a recurrence and is frequently followed by a protracted pyrexia, but unless the fever is kept under control there can be no improvement in other symptoms.

Instead of making daily entries on the charts, I find it more convenient to have a consolidated morning report of the temperatures and condition of the bowels for the previous 24



hours, which enables me in a few minutes, before making my morning rounds, to note anything unusual that may require special attention. The following report for March 31, 1902, which is fairly representative, shows how comparatively few of our cases run a high temperature.

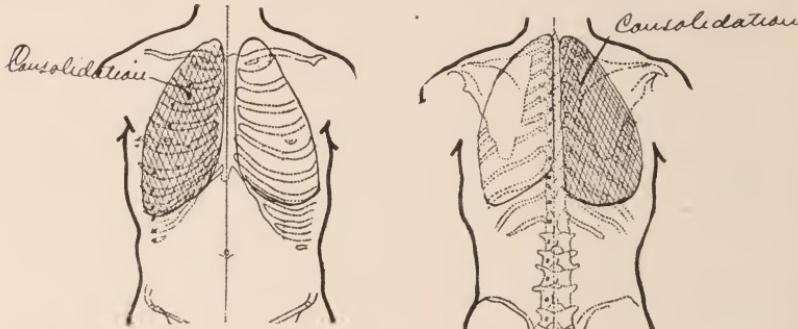
CONSOLIDATED DAILY REPORT, MARCH 31, 1902.

NAME.	TEMPERATURE.			No. of Def	NAME.	TEMPERATURE.			No. of Def
	7 A. M.	1 P. M.	6 P. M.			7 A. M.	1 P. M.	6 P. M.	
Adams.....	100	100	98	1	Keating.....	97.6	99.2	99.4	2
Albright.....	97	98.2	98.2	1	Keeffe.....	97.8	99	99	2
Alexander.....	96.8	98.4	98.6	2	Kelly.....	96.8	104	104	1
Andrews.....	95.8	98	98.6	2	Kennedy.....	98.4	98.6	100	2
Bailey.....	97.4	99	99	1	Killalie.....	98.4	97.8	99.6	1
Bardison.....	98	101	100.8	1	King.....	98	97	98.6	1
Bass.....	103	99	101.4	2	Koehl.....	97.6	98.6	99	2
Benton.....	97.4	98	98.4	2	Krueger.....	97.6	99.2	98.8	2
Black.....	98.4	102.4	100.4	1	Larsen.....	98.4	99	100	2
Bonham.....	98.4	98.6	100.2	—	Lippert.....	98	98.4	99	1
Borah.....	98.8	98.6	98.8	0	Long.....	97.2	99.2	99.2	3
Bowman.....	96.8	100.8	100.4	2	Lundgren.....	97.4	98.6	98.2	3
Brady.....	98	98.4	98.6	1	Lusty.....	99	98	102	2
Britton.....	97.4	99	99	1	Lyons.....	97.6	99	98.6	2
Briggs.....	98	100	99.6	2	McAllister.....	98	98.6	99.2	1
Bryant.....	97.6	98.6	98.4	2	McDonough.....	99.4	100.4	100.4	2
Burch.....	97	97.8	100.4	1	McGovern.....	97.8	99.2	98.6	2
Burns.....	97	98	98	1	McMahon.....	98	98.6	99.2	2
Burton.....	98.6	100	102.4	3	Marchessault.....	96.8	98.4	98.8	2
Cantwell.....	98	98.6	98.8	2	Martin.....	97.8	98	99	1
Carroll, D.....	97.6	99	98.6	1	Mason.....	97	99	98	2
Carr.....	97	99	98.4	2	Mattoon.....	97.6	98.4	98	2
Case.....	98	98.6	99.4	2	Maverick.....	97.4	98	98.4	1
Cihlar.....	97.6	99	99	2	Miller.....	98	99	98	2
Clifford.....	98	98.4	98.4	2	Moore, E.....	97.8	100	99.8	2
Connell, 1st.....	98.2	98.6	98.4	2	Moore, J. T.....	98	98.4	99.6	2
Connell, 2nd.....	96	98	98	1	Moore, T. W.....	97.2	98.4	99	2
Connor.....	98.4	99	99.4	1	Nally.....	97.6	99	98.2	1
Cook.....	97.8	99.4	99	1	Naylor.....	97.4	98.2	99	2
Crumby.....	98.2	98.4	98.2	1	Neely.....	97.2	98.2	98.2	1
Cummins.....	97.4	98	98.6	—	Oberauer.....	98	99	98.6	2
Curtis.....	97.6	99	99	2	Outtent.....	96.2	99	99.2	1
Custance.....	97.4	98	98.8	2	Owen.....	97.1	98	98.4	2
Day.....	98	98	98	1	Perrine.....	98	98.4	98.8	1
Dickerson.....	97.4	98.6	99	2	Perry.....	97.6	99	99	2
Davis.....	98	99	98.8	2	Peter.....	96.4	98.4	98.4	2
Dorcito.....	97.2	100	100.2	—	Pirie.....	98	99	98.6	1
Dougherty.....	97.6	98.2	98.6	2	Polly.....	97.4	98	97.4	1
Doughty.....	97.6	98.4	99	2	Power.....	97.8	99	98.8	2
Downs.....	97.6	98.4	98.6	1	Quinn.....	97.4	99.2	99	1
Duffy.....	97.2	99.2	99	1	Reeger.....	97.2	98.6	98.6	1
Dutton.....	97.6	98.6	99.2	2	Richard.....	97.2	99	99	2
Ellis.....	98	98.2	98.6	1	Ross.....	97.8	98.6	99.2	1
Ellmore.....	97.8	99.2	99	2	Roberts.....	96.8	98.6	99	2
Fay.....	97	98.8	99.8	2	Rowland.....	97	97.8	98.4	1
Fisher.....	97	98.4	97.2	1	Russell.....	97.4	98.6	99	1
Flaig.....	98	98.6	98.4	2	Ryan.....	97.6	98.2	98.4	2
Forsberg.....	97.2	99	99	2	Rymill.....	97.4	99.4	98.6	1
Fowler.....	97.6	98.6	99	2	Ryon.....	97.4	98	99	1
Fry.....	98	99.2	98.6	2	Scannell.....	97	98	98.6	1
Fuhrman.....	97.4	98.6	99	1	Schildt.....	98	99	99	2
Gallagher.....	98	99.2	99.2	1	Seabridge.....	99.4	100.6	100.8	1
Garrison.....	97.6	98	99	2	Seibel.....	97.8	98.4	99	2
Gaston.....	97.2	99.4	99.6	2	Sharon.....	97.4	99	98.6	4
Gettys.....	98	100.6	99.8	1	Sheehan.....	97.2	98.6	99	2
Ginnow.....	98	98.6	98.2	2	Slater.....	96.8	98.8	99	2
Girard.....	97.6	99	98.6	2	Smith, C. W.....	97.4	98.2	98.2	1
Graham.....	97.4	98	100	2	Smith, F.....	98	99	98.6	3
Green.....	98	99	99.2	1	Smith, L. C.....	97.6	99.2	98.8	2
Gross.....	97.6	98.2	98.4	2	Stastney.....	97	98.6	98.4	1
Guedry.....	95.8	98	99	2	Sullivan, D.....	96.8	98.4	99.2	2
Guest.....	98	99	98.6	1	Sullivan, T.....	98.4	99.4	98.4	3
Hale.....	96.4	88	99	2	Tate.....	97	99	98.6	1
Hansborough.....	97.4	99	98.4	1	Tayman.....	96.4	98.4	99	2
Harding.....	97.6	99	99.2	2	Thompson.....	97.4	97.8	98.6	1
Hardy.....	97	99	99	3	Tolliver.....	98	98.8	98.6	2
Harrison.....	98	98.2	98.6	1	VanHorne.....	97.6	99	98.4	1
Hayes.....	96.8	98	98.2	1	Vetters.....	97	98	98.8	2
Haynes.....	97	98	98.3	2	Walk.....	99.6	98.4	102	3
Hearon.....	98.2	99	98	2	Walker.....	97.2	98.8	98.4	2
Helmbold.....	98.4	99.4	100.4	0	Warden.....	97.8	99	98.8	1
Henderson.....	98.4	100.2	100.8	—	Weinhart.....	98	100	99.6	1
Hendry.....	97.6	98.6	99	2	Welcher.....	97.6	98.6	99	2
Hipp.....	97.8	98.4	98.6	2	Whalen.....	98	98.6	99.2	1
Hodnett.....	98.4	99.6	99.4	1	Wheeler.....	96.8	98.6	98.6	2
Hoggard.....	97.6	98.6	98.8	2	Williams, 1st.....	97	99	99.2	1
Hosbach.....	97.2	99	99	2	Williams, 2nd.....	98.8	99.2	98.4	2
Howe.....	98	97.8	99	1	Wilson, 1st.....	97.2	97.8	99	2
Jackson.....	97.4	98.4	98	1	Wilson, 2nd.....	98.8	97.8	98.4	1
Jacobson.....	97.7	98.4	98.6	2	Writeman.....	97.2	98.8	98.6	2
Jennings.....	98	99.6	99.8	1	Young.....	96.8	99	99.4	2
Karol.....	97.2	98	99.6	2	Zillman.....	99.8	100.6	102.6	1

Every patient in whom the temperature is over 100°, is in the infirmary, absolutely at rest and the large majority are far advanced cases.

In only one of the cases in this report is the temperature highest in the morning and our records show only 22 cases in which this inverse temperature has been observed for several successive days. Of these, 2 were discharged unimproved, 4 remain, with no prospect of recovery, and 16 died. (I may add that of the 4 remaining, March 31st, 3 have since died.)

We endeavor to reduce the irksomeness of the restrictions of the daily life of the patients to a minimum. The necessary supervision of the ambulant cases is so arranged as to permit them, as far as possible, to follow their natural incli-



nations and to enable them to pass their time along the lines of least resistance. They are not permitted to remain in their dormitories except at night and are compelled to live continually out-doors. During inclement weather and after the evening meal, they may go into the recreation rooms, in which, as also in their dormitories, the windows are always open. They are encouraged to go to bed early and must retire by 9:00 P. M. and rise in time for their *a la carte* breakfast from 7:30 to 8:30 A. M. The temperature of each is taken before breakfast, after dinner, and after supper.

At 9:30 A. M. they are assembled in the gymnasium (from which all devices for violent exercise have been removed) and each reports his condition to me personally. Having carefully noted the report for the preceding 24 hours, I

can more readily comprehend any symptoms requiring attention and give necessary instructions. The patients then form for the morning breathing exercise. I have adopted four exercises, one of which is practiced twice in turn every morning. The patients all facing me, are directed to keep the mouth closed and to gently fill the lungs. Then, following me in the exercise, at the command "one" they slowly inspire until the lungs are filled and resting a few seconds with the lungs inflated, at the command "two" rapidly expire.

These exercises gradually increase the chest measurements and the expansion of the lungs and I have hitherto observed no detrimental effects.

After the breathing exercise the patients scatter, some to receive local or special treatment and others to report for their bimonthly examination. The remainder walk or sit on the porches, where comfortable chairs and couches are provided, and engage in such pastimes as their fancies dictate. No violent exercise such as bicycling, horseback riding, tennis or baseball are permitted, but they are encouraged to play croquet, quoits, and golf.

Patients are required to carry spit-cups consisting of common square tin frames containing a folded paper cup. I have devised a pocket cup which is made by patients, for the use of the officers and others engaged in light work, and which when made from suitable paper has been found very satisfactory.

Large cuspidors are scattered on the porches and in the recreation rooms. These are also of folded paper in a tin frame and enclosed in a covered box, placed sufficiently high above the floors so that the covers can be conveniently lifted.

The paper cups are all burned in brick crematories, four of which have been constructed at convenient locations.

In considering the effects of altitude on the symptoms, it must be remembered that altitude alone, without a hygienic regimen is of little avail. No locality however favorably situated can confer immunity and cases of pulmonary tuberculosis originate in the most favorable climate.

Life in the open air, which is the keynote of our treatment, is at first uncomfortable, but in our dry air, bright sun and clear sky a tolerance is soon induced. Though we have frequent winds, the air is so dry that they are not objectionable, unless they are very high, such as prevail for a short period in the Spring. At no time during the summer is the temperature uncomfortably high in the shade, and for the past two winters 13° above zero is the minimum record.

Cough, excepting in advanced and laryngeal cases, soon becomes less distressing. Ordinarily it is easily allayed by heroin, in the extensive use of which I have yet to see tolerance produced or a habit formed. In a few cases it is a decided soporific, but I have never observed any untoward effects. Even in advanced cavity cases severe cough is readily ameliorated and the cavities are soon found dry on physical examination.

In far advanced cases with no laryngeal disease or emphysema, the cough rarely continues distressing and the cavities are usually found empty postmortem.

Further experience confirms my statement of two years ago, that hemoptysis occurs much less frequently than at lower altitudes. Nearly 50% of our cases have a previous history of hemorrhages and in many it has occurred very recently before admission. In very few has there been a recurrence and when recurring it is readily controlled, excepting in those with large excavations. In these latter cases it is generally fatal, if not directly, then from the subsequent rapid extension of the disease. This tends to confirm the opinion that the most important element in the causation of hemoptysis in the milder stages is increased arterial tension or vascular congestion, rather than erosion of the vascular walls, and its lessened frequency in higher altitudes is probably due to lowered arterial tension resulting from diminished barometric pressure. Doubtless the prohibition of violent exercise is also a potent factor in its prevention.

Night sweats are rare and readily amenable to treatment.

Laryngeal ulceration in the early stages has frequently been cured with simple palliative treatment and even when

accompanying advanced and extensive pulmonary involvement has in some cases disappeared.

Small pleural effusions are usually absorbed. If sufficiently large to require paracentesis for the relief of the dyspnoea, there is, as a rule, no recurrence if the effusion is sero-fibrinous.

In the tubercular involvement of other parts, especially of the cervical lymphatics and of the ribs, the lesions have improved equally as well as those of the lungs.

The longer I observe the effects of treatment in a high altitude, the more I am convinced that a larger variety of cases are amenable to its beneficial influence than is commonly believed. Cases with extensive cavities in both lungs and in which pyrexia continued for several months after admission, have finally improved to such a degree that ultimate recovery is possible.

As shown in the chart of increase of weights, extreme emaciation cannot be considered a contraindication nor does old age preclude a prospect of improvement in high altitudes. Two patients over 60 years of age have returned to the Soldiers' Home clinically cured.

In conclusion I desire to express my appreciation of the faithful cooperation and valuable assistance of 1st Lieutenants L. T. Hess and H. D. Bloombergh, and Contract Surgeons J. J. Curry and L. B. Ohlinger, of the hospital staff.

THE MOST PRACTICABLE ORGANIZATION FOR THE
MEDICAL DEPARTMENT OF THE UNITED
STATES ARMY IN ACTIVE SERVICE.*

BY CAPTAIN FREDERICK P. REYNOLDS.

MEDICAL DEPARTMENT OF THE UNITED STATES ARMY.

Part One.

THE organization of the Medical Department of the United States Army, on which the efficient performance of its duties in the field depends, should be founded on the requirements for active service, which requirements are definite as for all other parts of the army. A well defined organization for the Medical Department is indispensable, as the organization determines the manner in which the personnel is distributed and directed and the equipment utilized. Armies being maintained for war, their sole test of efficiency is preparedness for that eventuality.

The duties of the Medical Department as defined in the Army Regulations of 1901, are as follows:

"Par. 1570. The Medical Department, under the direction of the Secretary of War, is charged with the duty of investigating the sanitary condition of the Army and making recommendations in reference thereto, with the duty of caring for the sick and wounded, making physical examinations of officers and enlisted men, the management and control of military hospitals, the recruitment, instruction, and control of the Hospital Corps and of the Army Nurse Corps (female), and furnishing all medical and hospital supplies except for public animals.

Par. 1590. The members of the Hospital Corps will be enlisted for and permanently attached to the Medical Department. In time of war the corps will perform the necessary

*This essay received First Honorable Mention and its author was awarded a Life Membership in the Association, in the Enno Sander Prize Competition of 1902.

ambulance service under such officers of the Medical Department and assistants as may be detailed for that duty."

The subject of organization for field service may be considered under the heads of (1) Personnel, and (2) Equipment. The personnel of the Medical Department consists of medical officers (under which term may be included contract surgeons), dental surgeons, female nurses, the Hospital Corps, and civilian employees. The equipment embraces all supplies used by the Medical Department in the field, made up of the personal equipment of the officers and men and the equipment of the different units of the field organization.

THE PERSONNEL. ITS ORGANIZATION, DISTRIBUTION AND DIRECTION.

In the field the personnel of the medical department of an army at the present time is divided into a number of distinct categories each of which has well defined duties. Besides the different classes of personnel, we have to consider in particular each of these different categories or units.

Under the head of the organization of the personnel comes the consideration of the required number of each class and its most desirable organization. Under distribution is considered the duties of each category, its size in view of the duties required of it, and the special organization which will enable it efficiently to perform these duties.

THE PERSONNEL OF THE MEDICAL DEPARTMENT IN THE FIELD.

Medical Officers.	Female Nurses.
Dental Surgeons.	Civilian Employees.
Hospital Corps.	

CATEGORIES OF PERSONNEL IN THE FIELD ORGANIZATION.

At the Front.

The Regimental Personnel and the Personnel with smaller organizations of the line.

The Bearer Personnel or the Ambulance Company.

The Field Hospital Personnel.

The Administrative Personnel.

On the lines of Communication and at the Base.

The Stationary Hospital Personnel.

Sick Transport Personnel.

The Medical Supply Personnel.

The Reserve Personnel.

The Administrative Personnel.

MEDICAL OFFICERS.

At the time of the passage of the Act of February 2nd, 1901, reorganizing the regular army, the Medical Department consisted of one brigadier-general, six colonels, ten lieutenant-colonels, fifty majors, and one hundred and twenty-five assistant surgeons with the rank of captain and lieutenant. For the Army as it existed at the beginning of the Spanish War it provided $6\frac{6}{7}$ Medical Officers per 1,000 troops, or one to about 146 men. As regards relative rank of field officers to those below the grade of major, the proportion was about 34.89%. The Act of February, 1901, increased the Corps by 2 colonels, 2 lieutenant-colonels, 10 majors, and 115 assistant surgeons, and reduced the proportion of field officers to 25%. The same act fixed the war strength of the Army at 100,000 men, or nearly four times what it was in April, 1898.

It will be seen that the Medical Department for this new army lacked 63 of even being doubled, while its rate of promotion was reduced by 26.7 per cent. That its increase was not intended to be sufficient for the needs of the Army is shown by the authorization in the same act of 50 majors and 150 captains of volunteers, and the employment of as many contract surgeons as might be necessary. Of the latter 285 are at present employed. Subtracting the number of existing vacancies in the grade of assistant surgeons, (64), there are in service to-day a total of 740 regular and volunteer medical officers and contract surgeons.

It may be stated, as the opinions of most authorities, that in active service we will need for all duty at least six medical officers to each 1,000 troops. Of this number about 4 per 1,000 will be needed with the troops at the front, and the remaining two at the base and at home in administrative positions, general hospitals, etc. For garrison service our experience is that we have needed more than this number. The present surgeon-general has reported that in April, 1898, the medical department was not large enough for the army of 28,000 men.

For our army at its present size—about 85,000—six medical officers per 1,000 would mean a Corps of 510, or *231 less than the*

total number, including contract surgeons, at present employed, and 11 less than the total number of regular and volunteer medical officers now allowed by law. It would seem reasonable, therefore, to fix the present need of the medical department, to make it efficient and to put it on the status as regards promotion which existed at the beginning of the Spanish War, at three times its size at that time, and to authorize the appointment of as many volunteer medical officers as may be necessary. The Regular Medical Corps thus constituted would consist of the following officers:

- 1 Brigadier General.
 - 18 Colonels.
 - 30 Lieutenant Colonels.
 - 150 Majors.
 - 375 Assistant Surgeons, Captains and Lieutenants.
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To meet the present necessity for an unusual proportion of medical officers for service in the Philippines and to meet similar necessities should they arise in the future, the President should have authority to appoint volunteer officers whenever the number of regular officers is insufficient. This would enable the Medical Department to provide at once for an increase in the Army to war strength (100,000), and to meet emergencies making unusual demands upon it. It may not be advisable to increase the regular Corps to a size sufficient for the Army at war strength, but the necessity for its being maintained at a size large enough for the Army in time of peace does not admit of argument.

In active service it is recommended that each position filled by a medical officer carry with it appropriate and definite rank and pay, irrespective of the rank which the occupant for the time being, may hold in the regular or volunteer army. For example, the position of Chief Surgeon of a corps should carry with it the rank and pay of a colonel, that of Chief Surgeon of a division, lieutenant-colonel, that of Commanding Officer of an ambulance company, major, etc. This would permit of the selection and assignment of officers to duties for

which they had shown themselves fitted without regard to their actual rank in the regular or volunteer establishment.

Regular medical officers should be appointed after examination as at present provided, after which they should be sent to an army medical school for instruction.

Volunteer medical officers commissioned after passing an examination before a board of medical officers, (a majority of whom are of the regular service), and approved by the Surgeon General of the Army, are instructed with their organizations—regiments, field batteries, and Hospital Corps companies. In time of war, army medical schools for both regular and volunteer officers should be established at large general hospitals, to which newly appointed medical officers are to be assigned for instruction in their duties in hospitals and in the field. For practical instruction in the duties of medical officers in the field, the Hospital Corps companies of instruction might be utilized, one or more of which should be attached to the hospital or station.

CONTRACT DENTAL SURGEONS.

The services of dental surgeons in the field would of course be limited to stationary hospitals on the lines or at the base. With the troops at the front they would ordinarily have no permanent place unless perhaps in stationary camps. The equipment for the use of dental surgeons is now included in the Medical Department supply table.

THE HOSPITAL CORPS.

The Hospital Corps of the Army at present, (March 17th, 1902), consists of 277 hospital stewards, 412 acting hospital stewards, and 3419 privates, a total of 4108 men, or about 4 $\frac{7}{10}\%$ for the Army.

Present regulations provide, for garrison service, one noncommissioned officer to every four privates, 4 privates to every post, 4 to a post of 200 men, and two privates for each additional 100 men.

It is believed that on a peace footing the Hospital Corps should number at least 5% of the total strength of the Army.

This proportion might be larger than that necessary to perform the duties in time of peace, but it must not be forgotten that armies exist for war and their organization is based on that contingency. The hospital corps while caring for the sick in time of peace as well as war, should have its organization and training also for war.

With the Hospital Corps maintained at 5%, the troops on taking the field could take with them as ambulance and field hospital companies, say $4\frac{1}{4}\%$, leaving behind $\frac{3}{4}\%$ as a nucleus for companies to be organized for duty at hospitals at the base, to be recruited up to $1\frac{1}{2}\%$ or more, as the necessities might require. As the garrison footing here recommended provides for one noncommissioned officer to four privates, and the field footing for one to five, there would be left at the base a considerable proportion of noncommissioned officers, to form the organization of the base companies for service in general hospitals, companies of instruction, and for other necessary duties at the base.

Army Regulations concerning the field organization for the Hospital Corps are contained in the following:

Par. 1590. The members of the Hospital Corps will be enlisted for and permanently attached to the Medical Department. In time of war the corps will perform the necessary service under such officers of the Medical Department and assistants as may be detailed for that duty.

Par. 1601.....They will be instructed in such drills, both foot and mounted, as are necessary for their efficiency.....

Par. 1604. All members of the Hospital Corps will be equipped with canteen complete, haversack complete, waist belt and plate, one-half shelter tent complete, and the privates also with Hospital Corps pouch and litter sling.....

Par. 1616. In field service troops will be accompanied by such number of men of the Hospital Corps as may be determined by the post commander, on the recommendation of the surgeon.

Par. 1617. On the march each medical officer will habitually be attended by a mounted private of the Hospital Corps. Hospital stewards, acting hospital stewards, and at least one private of the Corps in each separate command will be mounted when serving in the field, and all privates of the Corps will be mounted when serving with mounted commands. Horses will be furnished by the Quartermaster's Department for members of the Corps on duty in the field when practicable. When no horses are available, special application for authority to hire must be made.

There is therefore no definite field organization, and present regulations, after specifying the personal equipment, merely define in general the duties of the Hospital Corps and its place in the Army. With a view to increase its efficiency in the Army and particularly for service in the field, the following recommendations are made:

The designations "Hospital Steward" and "Acting Hospital Steward" might with advantage be discarded for the more uniform and appropriate ones of Sergeant and Corporal. There seems to be no valid objection to such a change and there are many good reasons for it. The designation of acting hospital steward is both incongruous and awkward.

The grading of privates of the Hospital Corps into those of the first and second classes is recommended as adding to the efficiency of the Corps. All privates to be enlisted in the second class and advancement to the first class to depend on special qualifications and fitness for the position, as in promotion to the grades of corporal and sergeant; position in the first class to be dependent on continued good behavior and attentiveness to duty. Privates of the first class to be qualified in one or more of the following lines of duty:

Pharmacy.	Nursing.	Cooking.
Clerical Work, (Stenography).	Carpentry.	Blacksmithing.
Ambulance driving, and other duties requiring special aptitude and training		

Recruits with training in any of these lines could be advanced on showing fitness after a few weeks' trial. Others to be promoted to the first class as they become qualified therefor and as vacancies occur.

The advantages of such a classification are as follows:

(1) The increase in pay would more generally attract desirable men.

(2) Men with special qualifications, but who, for various reasons are not fitted for the grade of corporal, would still receive increased pay and other emoluments. In short, the grade of first class private would be a recognition of special qualifications.

The duties of Hospital Corps men are now so specialized that it is impracticable to make the average recruit competent to fill every position in garrison and in the field. Therefore let a man qualify in the line of work for which he has aptitude and liking. Men not qualified for the first class to remain in the second class on duty as police, orderlies, stablemen, etc. The pay of the second class private to be more than that of a private of the line and would be ample compensation for the duties performed. At present the pay of all is alike, and the men capable of manual work only receive the same amount as the competent nurse, dispensary attendant, or stenographer.

For service in the field the Hospital Corps should be organized into companies and numbered, which number is retained, no matter to what duty the company is assigned. The proportion of noncommissioned officers to privates should be one to five, and of sergeants to corporals, one to two, and of first class to second class privates, three to two. The pay of first class privates to be \$20, second class privates \$15; of non-commissioned officers as at present for hospital steward and acting hospital steward, except that first sergeants will receive \$7 per month in addition to their pay as sergeants. Non-commissioned officers are to be appointed as provided by present regulations.

Except when otherwise specified, the administration and interior economy of Hospital Corps companies should be governed by Article XXII of the Army Regulations.

In the regular service the Corps should be recruited by enlistment and transfer from the line as at present provided.

Volunteer Hospital Corps companies should have the same organization as those in the regular service. They are to be organized at the rendezvous, equipped, and assigned to the volunteer troops for duty. Volunteer companies of instruction should be organized at the rendezvous and attached to the station hospitals. These companies are to receive recruits for the Volunteer Hospital Corps.

Volunteer Hospital Corps companies might with advantage be recruited from distinctive localities and bear a local name. It would add much to esprit du corps and consequently to efficiency. For example, the services of the "First Detroit Field Hospital Company," or the "Third Philadelphia Ambulance Company" would be of the same relative importance, and have the same sectional interest to the residents of those localities as have now the movements and achievements of the state regiments when called out for active service.

Each Hospital Corps company should have the following organization: One first sergeant, one noncommissioned officer to every five privates, one sergeant to every two corporals, and three first class privates to every two second class privates.

The full strength of the companies should be about as follows:

1. Ambulance company. 22 noncommissioned officers, 113 privates.
2. Field hospital company. 22 noncommissioned officers, 98 privates.
3. Stationary hospital company. 22 noncommissioned officers, 113 privates.
4. Company of instruction. 22 noncommissioned officers, 113 to 150 pvt.

In addition to the present field equipment a short stout knife with blade about 12 inches long should be worn, in shape similar to the Cuban "machete", and carried in a sheath attached to the belt, the knife to be worn by both noncommissioned officers and men. A knife of this description, besides being an article of general utility in the field, as part of the equipment of the Hospital Corps man, would be of especial use in preparing splints and padding for the same, cutting brush for improvised couches and shelters, cutting fire-wood, clearing places for the passage of bearers with litters, and

many other duties of a like nature for which he is at present unequipped.

When serving in the field mounts should be allowed for noncommissioned officers and medical officers' orderlies.

COMPANIES OF INSTRUCTION.

It is recommended that there be attached to general hospitals, Hospital Corps companies of instruction to which all recruits are to be forwarded and where the necessary reserve Hospital Corps personnel is to be maintained. One such company would constitute a reserve to replace about 10% of the Hospital Corps quota at the front with 25000 troops. In time of war the uniform training of all recruits might be begun at once by organizing and attaching to base hospitals as many companies of instruction as were necessary. Should the conditions necessitate the mobilization for field service with the least possible delay, the recruits might be passed through the company, equipped, and sent to the field without hospital instruction. The length of the period of instruction in the company might also be reduced. Hospital training being least necessary in the personnel of ambulance companies and regimental medical service, men without such training should preferably be supplied to these places and men with hospital experience reserved for service at base and field hospitals.

The organization of a Company of Instruction should be somewhat as follows:

Medical Officers: 1 Captain. 2 Lieutenants.

Hospital Corps: 1 First Sergeant. 7 Sergeants. 14 Corporals. 113 to 150 Privates.

2 Trumpeters, 2 Artificers, 2 Blacksmiths, with about 14 others on special duty. The rest under instruction in classes.

NONCOMMISSIONED OFFICERS.

1 First Sergeant.	1 Stable Sergeant.
1 Property Sergeant.	1 Police Sergeant.
1 Mess Sergeant.	1 Head Cook.
1 Company Clerk.	12 Instructors.
7 for guard, police, special duties, etc.	

The equipment of a company of instruction, besides the personal equipment of the men, should comprise all the arti-

cles used by the Medical Department in the field and in sufficient amounts to equip an ambulance company and a field hospital.

The following outline shows the nature of the instruction which might be given in the company:

FIRST MONTH.

Daily, except Saturday and Sunday.

Anatomy and Physiology, 1 hour.	Diet Cooking, 1 hour.
Bandaging, 1 hour.	Bearer Drill, 1 hour.
Calisthenics and Company Drill, $\frac{1}{2}$ hour.	

SECOND MONTH.

Nursing, 1 hour.	First Aid, 1 hour.
Care of Animals, 1 hour.	Bearer Drill, $1\frac{1}{2}$ hours.
Calisthenics and Company Drill, $\frac{1}{2}$ hour.	

THIRD MONTH.

First Aid, 1 hour.	Elementary Hygiene, twice a week, 1 hour.
Clerical Work, three times a week, 1 hour.	Materia Medica, 1 hour.
Bearer Drill and Practical Field Work, $1\frac{1}{2}$ hours.	
Calisthenics and Company Drill, $\frac{1}{2}$ hour.	

FOURTH MONTH.

Clerical Work, 1 hour.	Pharmacy, 1 hour.
Materia Medica, 1 hour.	Practical Field Exercises, 1 hour.
Calisthenics and Company Drill, $\frac{1}{2}$ hour.	

SATURDAY.

Inspection.	
Articles of War.	Company Regulations.

FEMALE NURSES.

The Nurse Corps as part of the Medical Department of the Army has been established by law and its organization is adapted for war as well as peace. In time of war there should be one or more nurses' training schools attached to large general hospitals to which all nurses should be assigned on entry into the service to receive practical instruction in military nursing and hospital routine.

They should form part of the personnel in stationary hospitals whenever it is practicable to employ them. The pro-

portion allowed to each hospital will of course depend on the many conditions. Ordinarily, it would seem that the quota should be 5%—7% of the bed capacity.

CIVILIAN EMPLOYES.

The medical department of an army in the field should have authority to employ certain civilian help whenever the commanding officer on recommendation of the senior medical officer deems it advisable to do so. Especially in the tropics is such help necessary and it can generally be obtained in abundance. The services of the Chinese litter bearers in the Philippines were of great value and it is the opinion of most authorities that in a country where wheel transportation is not available or is insufficient, that, all things considered, native bearers furnish the most satisfactory means of transporting the sick and wounded.

AMBULANCE COMPANIES.

"All must desire that men badly wounded in action and consequently deprived of the power of defence as well as of offense, should not be subjected to the mental torture, increased bodily suffering, and serious risks inseparable with" the leaving of the wounded where they happen to fall, until firing ceases.

"It [the bearer service] is probably the most difficult part to arrange satisfactorily from an economical point of view. The difficulty is to organize a system for meeting a want, which is only a very occasional one, in such a way that the men concerned may be advantageously employed at other times when the particular need in question does not exist. It is true that the necessity which the combatants of an army are organized to meet—fighting—is only an occasional one; but the general security is universally understood to depend largely on having men prepared to meet this want at all times, while the necessity for having men trained and ready for the removal of those who may fall wounded has been usually kept out of view. So also guns and other implements of warfare are only employed in the work they are specially for at rare

intervals, while it is certain that, whenever they are so employed, the need for the removal and care of the wounded will simultaneously occur; but here again, although the importance of studious prevision with respect to every minute detail of the means of inflicting wounds has been universally acknowledged, the need for similarly careful preparation in the arrangements for meeting the surgical necessities which would result from their use has been recognized by few ruling authorities, and by them has hitherto been largely ignored in practice." (Longmore).

The number of ambulances at present allowed by regulations is one to every 400 men. This allowance, based on Civil War experience, may be accepted as a liberal one. For the extraordinary needs of great battles the number of ambulances available has never been sufficient, and a large majority of the wounded have been conveyed to the rear in army wagons and carts of the country. "It has been always impossible to maintain the amount of carriage necessary to meet the eventualities of battle." Furse: *Lines of Communication in War.*

The allowance of ambulances being regulated by the size of the organization has advantages over an allowance of a certain number to a regiment or brigade, in that the troops are provided for in the same proportion whether the regiment, brigade, or division is cavalry or infantry and whether at full strength or not. The number of ambulances being dependent upon the size of the command, will consequently make the size of the ambulance company personnel a varying one.

The ambulances allowed a division (35 to 40, depending on its size)—with the necessary personnel is undoubtedly too many to be effectively administered as one company. The most desirable unit would be a company to each brigade for the same reasons that make brigade field hospital units seem the most practicable. There would be in a brigade ambulance company attached to an infantry brigade at full strength, 15 ambulances, allowing one ambulance to every 400 men.

From an ambulance company there should be detached one ambulance to accompany each regiment and field battery

on the march and in camp but rejoining the company at the beginning of an action. An independent or isolated regiment should have attached its full quota—4 for an infantry and 3 for a cavalry regiment of full strength.

In considering the personnel of the ambulance companies, it might be well to first note the tendencies of foreign armies in this direction and then to compare them with the experience of our own. The average of all the large armies of Europe is $2\frac{3}{10}\%$. The most highly organized field medical service is probably that of the French army. The present organization we may consider "the best exponent of modern field sanitary organization, as well as of the modern humanizing spirit which, unable to prevent seeks to mitigate the horrors of war. In no other army are the duties of all concerned so clearly and explicitly formulated." (Havard). For the "work of the first and second lines" performed by the bearer personnel, the French allowance is 2%. The work of the "first line" being that with the regiments and at the dressing stations, and of the "second line" between those and the field hospitals.

The Army Regulations of 1889, (omitted in later editions), fixed the personnel of the Hospital Corps for duty with the ambulances at 2% of the force and the field organization of 1898 provided ambulance companies in about this proportion which included the personnel with regiments.

"The great improvements in fire-arms tend towards making the rendering of immediate aid in exposed places almost an impossibility; and yet to leave wounded men under fire, without some attempt at relieving their pain may be policy, but it is most repugnant to men who take pride in the work of tending wounded, for it looks like failure or neglect.

"What can be done under fire, if anything can be done at all, men can do *singly*. One ambulance soldier can get forward with no more risk than a fighting soldier, and this bearer can by himself most likely perform three-fourths of the entire duty he has to do on the field. He can administer water and stimulant, he can arrest bleeding, and he can apply dressings

and splints and possibly move a man a yard or two to some sheltered hollow. The fourth part of his duty, as per manual, is the removal of the patient; it will be no great disadvantage if that is done a little later, under less trying conditions.

"The removal of a wounded man requires, according to the manual, a squad of four men. This squad exposes a surface of about 6 feet by 6 feet if advancing or retiring, and 6 feet by 8 feet if moving to a flank; thus they offer an immense target, and a slowly-moving target, too, for the bearers must move slowly if they are to carry a patient carefully. It was impossible for bearers to collect wounded in 1870-71 under severe fire, and rifles and guns work still more rapidly and at much longer ranges now than they did 30 years ago.

"Since parties of men are necessary to remove wounded, and stretcher parties cannot work where severe firing is going on, it follows that *when* they are able to start, then the most rapid collection will be well worth organizing for, and particularly so if close at hand on the battlefield (the sanitary service) has arrived which can provide skilled surgical aid at once to those that need it, and shelter and nursing to those whose first dressing is sufficient for the time." (Stapleton).

If we are to accept the conclusions of those best qualified to know, it appears to be proven that 2% is not enough for personnel of ambulance companies to meet the possible requirements of future wars. Our former allowance of this size was based on the experiences of the Civil War, since which time the conditions of warfare have been revolutionized. We may take it for granted that as the conditions of any future battles in which our troops may be engaged will be similar to those of other armies, consequently we need bearers, dressers, and other ambulance company personnel in about the same proportion. It is therefore believed that the size of the bearer company should be at least $2\frac{1}{4}\%$ of the brigade—for a brigade at full strength, 135 men. For smaller brigades the size of the ambulance company should be smaller but in the same proportion to the total strength.— $2\frac{1}{4}\%$.

The present regulations requiring all company officers to

instruct their men in the duties of bearers are undoubtedly sound in principle, being founded on the generally accepted belief that in future wars the first help for the wounded in action must, in the great majority of cases, come from the wounded man himself or from his comrades who are near at hand. In time of war all officers and men should carry a first-aid packet. Besides being familiar with the method of its application and the principles underlying first-aid treatment of wounds, they should know how to treat severe hemorrhage, to immobilize a fracture and to transport wounded both with and without litters.

FIELD HOSPITALS.

Dependence on regimental hospitals no longer obtains, all modern experience being in favor of a larger unit. It is evident that the field hospital, composed essentially of the consolidated regimental hospitals but independent of regimental organizations, is the most desirable one for modern service. Longmore says:

"Independently of the waste in a system which leads to an unnecessary multiplication of articles when a less number would suffice, it has become impossible for troops moving in the field as quickly as they now do to take such bulky stores with them."

Our own experience is well expressed by Greenleaf, who writes:

"The advantage which this system possesses over the regimental system rests upon the fact that the chief surgeon of the corps, who is always present with the general commanding and knows the progress of the battle, may send any number of divisional organizations, or any parts of divisional organizations to parts of the line which are most heavily engaged. He may send a section from the division field hospital and the ambulance company to one part of the field, and, on receipt of information that the troops there are hard pressed, he may send another organization to the same point and if necessary may add the divisional hospital from another part of his corps, the forces at his command being ample and suffi-

cient when handled in this manner for caring for any number of men who may be wounded. Under the regimental system this procedure was impossible, because no regimental hospital could be detached from its regiment, and it not infrequently happened that a regimental hospital might be overwhelmed with wounded, while the officers and men of the hospital belonging to its neighbor would be idle and helpless in the way of assistance, since they themselves might at any moment be called upon for similar service to their own people."

Yet there are reasons why it is desirable to retain some form of regimental hospital organization. Its purpose as defined in paragraph 30, Manual of the Medical Department, 1900, shows the need of it in our service; and for an army made up largely of volunteers as ours must be in any large war, "the desirability of the regimental hospital can hardly be questioned, as it saves many a man to his company who, had he been transferred to sanitary establishments further to the rear, would have been lost to the service." (Hoff).

The size of the field hospitals in European armies is usually 100 to 200 beds. It is probable that the latter figure represents the largest practicable size. This was their size in our field organization of 1898.

The amount of equipment and its necessary transportation and the number of the attached personnel, together with the perfection of organization required, make disorganization liable to occur at the times when the hospital is most necessary, and render it in every way desirable that each unit should be at all times well within the capabilities of one man to administer and direct.

The proportion of bed capacity in field hospitals to the total number of troops next requires consideration. To meet all needs which may reasonably be expected this may be stated to be about 3% of the total strength, with supplies to care for four times this number of slightly wounded cases. "The experience of the past has shown. that its (the field hospital) service will not fail to give satisfaction." (Smart). The organization for the Spanish War provided field hospital accomodation for 3% with $\frac{1}{3}$ of 1% in reserve.

During the Civil War regiments averaged 500 men. Regiments of infantry now number at full strength, 1,886 officers and men, or over $3\frac{1}{2}$ times the size of those of the former period. A cavalry regiment at full strength comprises a total of 1,288. The strength of a brigade of three regiments of infantry is 5,658, not including the brigade headquarters, staff, medical department personnel, etc. Including the latter, its full strength would be not far from 6,000, and that of a cavalry brigade, (three regiments), about 4,000. A division of two infantry brigades would number over 12,000, while one of three brigades, over 18,000.

In considering the size of a division hospital for the present organization of our army we are confronted with the question of the probable size of the division. Will our divisions consist of two brigades or three? The question must remain unanswered by us as one not yet determined by the War Department. Present regulations, published before the re-organization of the Army, define a division as consisting of three brigades and two or more batteries of field artillery, "but the rules prescribed are applicable to a less or greater number." Field hospitals for a division of 12,000 men should contain 360 beds; for a division of 18,000, 540 beds. It may safely be assumed that a division hospital of either of these sizes would be undesirable by being too large an administrative unit in the field. It is therefore advisable to divide it and evidently the most practicable plan is to allot one section to each brigade. A 3% unit for an infantry brigade would be about 180 beds, and for a cavalry brigade about 120 beds. Field hospitals of such capacities would be of desirable size and would probably meet all requirements.

The regimental hospital should be regarded as a detached portion of a field hospital. Its size as given in the Manual for the Medical Department, 1900, is for 12 beds, "except when regiments are isolated, in which event the bed capacity may be increased as necessary." Such a hospital is too small for the probable needs of an infantry regiment of full strength. An increase of six beds would make its bed capacity about 1%

of the regiment and it is believed would be sufficient for all ordinary demands. Where "regiments are isolated" its capacity should be further increased to 3% (54 beds), or even more, should the conditions demand it. The capacity of regimental hospitals for cavalry regiments might be fixed at 12 beds each, and for independent service with the same increase to 3% (36 beds) or more if necessary.

Allowing regimental hospital detachments of 1% bed capacity, there will remain accommodation in the field (brigade) hospital for 2%, or 126 beds for infantry, and 84 beds for cavalry. These allowances are for regiments recruited to their maximum strength and all present.

The practicability of making field hospitals of a variable size, within prescribed limits, would seem to be sound. Besides allowing for varying sizes of brigades, it would also allow for the conditions of each campaign, which always demand careful consideration.

Fixing the maximum size of the field hospital at 126 beds, (exclusive of the regimental hospitals), we have a hospital which is divisible into three regimental (ward) sections of 42 beds each; each ward consisting of seven hospital tents. With the regimental hospitals attached, (which probably would be the case in campaign), the field hospital would be one of 180 beds, each regimental section containing 60 beds.

The quota of personnel attached for duty in field hospitals varies little in modern armies and averages about $2\frac{1}{2}\%$ of the command. Unfortunately conditions have so changed in regard to the care of the wounded that the experience of the Civil War cannot assist us in the matter to any considerable extent. The average quota at that time was $1\frac{1}{2}\%$, made up of details from the line, as there was no Hospital Corps. The field organization for the Spanish War allowed $1\frac{6}{10}\%$. which in view of the developments in other armies may be considered as below the number needed. Of this organization the Chief Surgeon of the Third Army Corps has said that it "is open to criticism only in one direction—its strength is inadequate to meet the demands of an army or recruits upon an untrained organization. In practice the number proved utterly inade-

quate owing to the misuse of the field division hospitals as fixed hospitals."

We may therefore conclude that the personnel needed in the field hospitals of our Army, in order to meet all demands, should be at least 2%. Assuming this proportion and fixing each regimental hospital detachment at 15, we have remaining in the field (brigade) hospital, 75, or a total of 120,—2% of 6,000 men, the maximum number in an infantry brigade of three regiments at full strength, including the Medical Department and members of other staff corps, civilian employes, etc. In reality the proportion would exceed 2% by a varying amount as it is seldom that any organization has its full complement of men with it "for duty."

It is believed that this quota is sufficient for our needs and could satisfactorily perform all duties that might reasonably be expected of it.

A FRENCH VIEW OF THE ASSOCIATION OF MILITARY SURGEONS OF THE UNITED STATES.

THE official French military medical journal (*Archives de médecine et de pharmacie militaires*) publishes in full the report of Professor Nimier, the representative of that government at the eleventh annual meeting of the Association. The report gives a well-digested description of the army medical department including the personnel of the medical corps, the hospital corps, the nurse corps and the dental corps, discusses American military hospitals with some remarks also upon our civil hospitals, and describes succinctly the various sessions of the Washington meeting, closing with the remark that "this simple enumeration shows how constantly we should watch the work of our American *confrères*. To send representatives each year to the meeting of their Association should not be regarded as a mere courtesy to the American government, for it will afford an opportunity for the instruction of our delegates, both as men and as physicians; and will moreover afford to our colleagues of the United States army an opportunity to estimate at their true value contemporaries whose work they have not hitherto been able to appreciate."

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Editorial Department.

OBSERVATIONS ON GUN-SHOT WOUNDS.*

A VALUABLE paper, recently published by Major Winter, presents in an interesting manner the author's practical experience. After a short discussion of the general characters of modern military rifles and missiles, he asserts his opinion, based on his observation of wounds from both classes of weapon, that the large leaden bullet (e. g. Remington, 45. cal) striking at close ranges, i. e. within 500 yards, has a vulnerating effect of greater intensity than the smaller jacketed (Mauser) bullet. This has been particularly observed in the case of the long bones and a case is cited (Case 5.) showing the gravity of the injury inflicted at very short ranges by the large bullet. In this case the tibia and fibula were comminuted in such way as to suggest to the writer the wholesale lacerations, resulting from the crushing injuries of moving railway trains.

The classical exception of wounds of the skull from this general result is cited. There has been, in his observation, no manifest difference in the amount of hemorrhage following vascular wounds, from the two types of missiles.

The opinion is advanced that the smaller bullet does not entail the shock, ordinarily following wounds from the larger missile. An instance is cited of a soldier shot at the battle of Zapote in the Philippines. A small calibre bullet entered the neck just above and behind the clavicle, and traversing the entire trunk emerged near the anus. This man lived over twelve hours, and exhibited little shock.

The writer strongly advocates the general policy of interference, under suitable conditions, in those wounds which are not

* "Some Observations on Gun-Shot Wounds, during the Spanish-American and Philippine Wars," by Francis A. Winter, Capt. and Asst. Surgeon, U. S. Army. Read before the Society of City Hospital Alumni, and published in the St. Louis *Courier of Medicine*.

declaredly aseptic from their inception, urging this with especial reference to cases, wherein there is any bone involvement. It has often happened in his experience that wounds were permitted to remain unexplored, and a resultant sepsis revealed the presence at the bottom of the wound of such material as the flannel from a blue shirt. He therefore urges complete surgical cleanliness, saying "Certainly no harm can come from cutting down on the bone under asepsis, and it makes one's efforts intelligent, instead of grafting upon them the quality of work in the dark." Several cases are cited in support of this general proposal to go into wounds sustained through clothing, especially if it is known, or there is strong reason to believe that there is bone injury at the bottom of the wound, and in this connection the following statement is made "I do not think that severe comminution, with inevitable denudation of bone and separation of fragments offers any chance of spontaneous reposition and healing by osteoplastic processes, and it has become my steady habit to remove fragments in such gun-shot-wounds." The author then cites a case of diffuse comminuting injury in the humerus, near the shoulder joint, illustrating the expediency of going to the bottom of this class of cases, and advert's to the happy and uneventful convalescence of this soldier, from whose wound a large number of bone fragments were removed.

The notorious uncertainty in the progress of bullet paths through tissues leads the author to cite the case of a soldier who was shot in the hypogastrium, while in the kneeling posture. The aperture was without exit and was a small circular puncture, made by a small calibre bullet, apparently striking head-on.

Exploration seemed to be indicated, but a rather belated complaint by the soldier that he had a pain in his hip joint, led to examination of that vicinity, with the result that a cast steel projectile, about 40 cal. was removed by incision. Reference is made to the absolute absence of all subjective and objective signs along the path of the bullet, in its passage from the point of entry to the site, whence it was removed.

The writer takes the position that surgical exploits of magnitude, are ill timed as immediate measures after material battles,

taking the view that conditions are then uniformly such, that elaborate details of possible benefit to one subject involve the necessary sacrifices of the many who require attention. His observation of coeliotomy done after the Santiago fight did not show him anything to encourage resort to such measures.

THE SMALL CALIBRE BULLET AND THE TREATMENT OF BULLET WOUNDS IN THE FIELD.*

AN interesting discussion of the surgery of the small calibre bullet is given in a monograph by Dr. Johann Habart, instructor in military surgery at the University of Vienna. In part I, he remarks that the increased effect of the modern small calibre rifle with its smaller jacketed bullet and smokeless powder over the old soft lead bullet, is due to the increase of the specific cross section energy imparted to the modern bullet and to the increased initial velocity given to the projectile. By increasing the length, and reducing the radius of the projectile the cross section energy of a bullet of the same weight is increased and vice versa; its percussion and penetration effects are intensified, which enable the projectile to overcome great resistance even at great distances.

Two tables are presented in this part of the pamphlet: Table I describes the small calibre rifles in use by the various European Armies, and their bullets. Table II gives the ballistic facts of the latest jacketed projectiles of 8 m.m., 6.5 m.m. and 5 m.m. calibre, i. e., the velocities and dynamic effects in kilogrammeters at various distances.

In part II, is taken up experiments on living and dead horses and studies of accident cases with the 8 m.m. jacketed bullet, and comparisons with wounds caused by old bullets.

The hole of entrance differs in size from 3 to 6 m.m., it rarely exceeds these dimensions. A bulging of the tissues surrounding wound of entrance may be present and is an unmistakable sign of the explosive effect. Sometimes, there exists a brownish or

**Das Kleincaliber und die Behandlung der Schusswunden im Felde. Eine kriegschirurgische Skizze.* Von Dr. JOHANN HABART. 8 vo. pp. 55. Vienna, Josef Safar, 1894.

blackish rim of 1-2 m.m. around the wound of entrance from shots within 200 paces; fragments of projectiles may produce slits instead of round openings.

Wounds of exit are from 5 to 11 m.m. in diameter, the edges are often round but generally torn and star shaped. After explosive effects, the diameter of this opening may be from 1.5 to 3 c.m. and more. In this case it often contains muscular shreds, or fragments of bone. There may be several wounds of exit from fragments of bone splinters, or a slit-like opening. The size of the openings, as a rule, is no indication of the severity of the injury. Wound canals, entirely free from foreign bodies, are extremely rare, they generally contain fibres of clothing through which the bullet has passed, or pieces of the bullet, bone sand, etc. The canal itself is generally clean cut and often difficult to follow through soft parts. This is different after an injury of compact bone, here the canal behind the injured bone is larger, it becomes more funnel shaped, the tissues are more contused. The smooth wound canal gives greater liability to hemorrhage than the bruised torn canal caused by the old projectile. In consequence of the small size of hole of entrance and exit and the ready occlusion of the small bullet holes by coagula, the wounds resemble more aseptic subcutaneous wounds. If the cavities of the heart are invaded by the bullet, explosive effect may be produced. In lungs, the explosive effects are rare, canals are smooth, there is apt to be more blood in pleural cavities.

Abdominal wounds are most dangerous lesions. Perforations may be very small, again the openings may be from 10 to 12 m.m. in diameter and more, allowing contents of intestines to flow into the peritoneal cavity. In explosive effects, big tears are very often seen; large vessels and nerves may be injured.

Effect on bones: This depends on the anatomical histological composition of the bones, the energy of the projectile and its angle of incidence. Short and flat bones and articular ends are generally merely perforated, fissures may form and increase in numbers as hard parts are hit; shafts of bones may be broken up into smaller and larger pieces.

Within the I Zone (Explosive zone up to 500 m. distance): Extensive splinters of long bones occur, great quantity of bone sand is in wound, many large free fragments, a great number of shorter or longer fissures around smaller and larger fragments, deformity of bone, are apt to result. the wound of exit is torn, everted margins, funnel shaped cavity behind bone. The further away from the middle of the shaft the less splinters.

Within the II Zone (Up to 1200 m., that of medium fire distance): Splinters remain more attached to periosteum, longer lines of fracture but less displacement, bone sand is present, no funnel canal, clean wound of exit. With less density of cortical layer, more sponginess, clean perforation may occur at 750 m. distance.

Within the III Zone (1200 to 2000 m., that of far fire distance): Large splinter fractures without displacement, bone sand.

Within the IV Zone (Artillery distance, that of the nearest dressing stations to field of battle): Even at this distance bones may still be perforated or fractured.

Wounds of a serious nature are met with from direct involvement of important organs and explosive bone wounds, the seriousness of wounds of the soft parts has diminished in many respects. Bullets may carry infection into tissues from contact with the ground or by passing through mouth, nose or intestinal or urinary canals. Infection from particles of clothing is very rare.

Wound dressings impregnated with bactericides are of doubtful value, sterilized dressings are preferred at the present time, on the principle that bacteria should be kept away from wounds. These should be used for first dressings at dressing or ambulance stations.

Part III relates to the treatment of bullet wounds. The further fate of bullet wounds depends on the quick removal of the wounded from the battlefield to the field hospital. These should be fitted up with all means of asepsis and antisepsis. All the wounded should be removed to these and attended to in 24 hours. On dressing stations, the wounds should be subjected to cleaning only under exceptional conditions, only when soiled and in case operations are immediately required, otherwise they are only to be covered with aseptic dressings. A saucepan, normal

salt solution, soda, sterile water and a brush should form part of the outfit here. Cases of hemorrhage, threatening asphyxia, and possibly abdominal wounds are the only cases which may require operative interference at these dressing stations. Field hospitals should be close to the battlefield; in these a special place should be set aside for abdominal cases, in charge of a competent surgeon. Here, under modern conditions, the mortality from wounds should be reduced to a very small percentage (1.5% in the field hospitals of Belgrad & Sofia 1885-1886).

Immediate operative treatment should be resorted to in field hospitals for:

1. Perforating gunshot wounds of abdomen, with hemorrhage, and perforation, or prolapse of intestine. Every military surgeon should be familiar with all intestinal operations, the various sutures, anastomoses, formation of artificial anus, resections, gastrostomy, colotomy, Kraske's operation.

2. Wounds of cranium presenting symptoms of brain irritation or paralysis.

3. Partial or total perforation of blood vessels and nerves; sterilized silk is recommended as the best material for sutures and ligatures.

4. Asphyxia: Here tracheotomy or relieving pressure on lungs through intrapleural hemorrhage, pneumothorax, etc., according to the cause, are indicated.

5. Cases of threatening sepsis.

Bullet wounds to bones, even with symptoms of explosive effects, require conservative treatment with asepsis or antisepsis and immobilization. Total resections of joint surfaces are indicated only in conditions of most extensive splintering of epiphyseal surfaces, generally partial primary or secondary resections are sufficient. Primary amputations and exarticulations are indicated only in extensive destruction of limbs, complicating splintering of bones with tears of the large vessels and nerves or extensive destruction of the soft parts.

Retained bullets may remain without danger in the body. It is not good surgery, to probe or search in canals for bullets unless special symptoms call for search. F. W. F. WIEBER, U.S.N.

NORWEGIAN INVESTIGATIONS ON SOLDIERS' FEET.

BY arrangement of the Norwegian Association of Military Surgeons in Christiana, measurements were taken during the summer drills in 1900 of the soldiers' height and also of the length of their feet. Altogether 6443 soldiers were examined. This unusually large amount of material has been worked out by Capt. H. Bryn and published in the *Norsk tidsskrift for militarmedicin*.

To begin with the author endeavors to answer the question: *Is there any difference between the right foot and the left with regard to length and breadth?* In 28.9% of the men the feet were found to be of the same length, in 32.2% the right foot and in 39.9% the left foot was the longest, the difference however is seldom more than 1mm. and it differs in various parts of the country. In 6443 men the total length of the right foot was 170.808.4 cm. while that of the left was 170.842.6 cm.

In 20% the right and left foot have the same width, in 25% the left foot is the widest and in 55% the right foot. The proportions differ much in the different parts of the country.

The Normal Foot.—With the great majority (about 70%) of the Norwegian army the length of the foot is between 25.5-28.5 cm. In 6443 men both feet had a total length of 341651.0 cm. The average length is 26.513 cm. The average height of the same men was 171.1 cm. The proportion between the height and the length of the feet is therefore 6.45. The comparative footlength, that is in proportion with the height is quite invariable and is 15.5%; for every cm. the height increases, the average foot length increases 0.155 cm.

With the greatest part of our soldiers the breadth of the foot is between 9.5-10.5 cm. The breadth increases with the height and varies in the different parts of the country, as also the proportion between the length and breadth of the foot varies.

Atypical Foot.—In each class of soldiers with the same height there are a few whose comparative footlength is not 15.5%; their number is small among men between 160-185 cm. high, but if those under 160 or over 185 are examined, quite striking ir-

regularities will appear. The author ascribes this to the fact that men, who have not at the age of 23 years reached 160 cm. or are above 185 cm. are abnormal. There is no harmony between the age and height of the individual and this is often connected with irregular development of the different parts of the body. With the small men a well proportioned foot is exceptional. These atypical feet are of great practical interest as it is difficult to procure them a fit in foot-wear.

It is more difficult to procure suitable foot-wear for the Norwegian army than for most other armies. Our army consists of farmers, sailors and fishermen. From the want of use the feet of the latter have probably changed their form.

The boots of our army must be adapted equally to stony ground, dusty roads and marshes. The author includes that these investigations have proved

1. That there are several foot-types in Norway.
2. That our present foot-wear is not suitable.
3. What foot-wear should be suitable.

HANS DAAL, *Sanitary Captain (Norway)*.

MOUNTED BEARER COMPANIES FOR CAVALRY COMMANDS.

FOR service with cavalry, Lieut. Col. H. G. Hathaway, R.A.M.C. recommends (*British Medical Journal*, Oct. 11, 1902) a two wheeled cart with a mounted detachment of five men for each regiment. Eight such carts with their detachments would be sufficient for a mounted bearer company. This force would be small but cavalry usually have a smaller number of disabled than infantry. Nothing that can be avoided should be loaded upon the carts; the detachment should carry as a part of their personal equipment most of the required surgical supplies and compressed drugs. Litters, splints, cooking utensils and the like would properly form a part of the load of such a cart. Lieut. Col. Hathaway considers the elements of success in such an organization to be:

1. Suitable animals with something to spare.
2. Nothing unnecessary carried in carts or on animals.
3. The instruction of all men to be good horse masters in addition to their ordinary duties.

Reviews of Books.

SAMARITAN BOOK FOR SOLDIERS—THE INDIVIDUALS OF THE ARMED SERVICES.*

THIS book has for its object, to carry first aid, which has taken such a firm hold among all other classes of society, also among the individual soldiers and corresponds to the first-aid works of Pilcher and others, issued in our own country.

Accidents and injuries, also sudden illnesses happening more frequently among these than among other bodies of men and at times where sanitary military assistance and even sanitary equipment and all appliances are lacking (in detached bodies), appeared to call for a work of this kind as a desirable guide for the more intelligent men, to enable them to treat these conditions intelligently, until proper aid can be procured. The book differs from those used in the instruction of the members of the hospital corps by giving more detailed descriptions of all symptoms, such as would lead to a more correct understanding of the nature of injuries, illnesses, or danger symptoms, and goes very thoroughly into the necessary treatment under the varied conditions that might be encountered in peace or in war.

It begins with a short description of the various structures of the body and their functions, it then speaks of nursing, treats of febrile conditions, special symptoms and their management and goes over the various forms of hemorrhage and their special treatment. In the natural course of sequence wound treatment follows, infections of wounds are explained, how produced and how avoided. Improvised dressings, etc., are very fully gone into and, where possible, illustrated. Naturally gunshot wounds, with and without complications, and their various indications and management, are gone into very fully.

**Samariterbuch fuer die Angehoerigen der bewaffneten Macht.* Von Regimentsaerzt Dr ANTON JERZABEK. Chefaerzt und Lehrer an der k. u. k. Cavallerie-Cadettenschule. 8 vo. pp. 240. 216 illustrations. Vienna, Johann Safar, 1902.

Erysipelas, poisoned wounds, tetanus, bites of venomous insects and reptiles, rabies are mentioned and disposed of.

Fractures and dislocations, the various temporary dressings, advised, and illustrated, follow. All kinds of burns such as caused by heat, electricity, or cold, follow separately.

Foreign bodies in eyes, nose, ears, etc., receive consideration. When and how to produce artificial respiration (5 methods are mentioned). Heat stroke, fainting spells, sunstroke, snow blindness, sea sickness, sore feet, are referred to. Acute mania, how to be treated. Treatment of various forms of poisoning, etc.

The book closes with a very complete review of the methods of transporting the sick and wounded, paying special attention to improvising means at hand for the purpose.

The object of the book, to teach temporary assistance until expert assistance can be procured, to do this intelligently, using properly the means offered by surrounding conditions, is not transgressed. The lucid descriptions and the numerous illustrations make the book valuable, complete and instructive.

F. W. F. WIEBER.

GNATS AND MOSQUITOES.*

RECENT investigations have shown the mosquito to have so distinct a place in the etiology of human disease that a consideration of these insects must hereafter be added to the subjects of study for the medical practitioner. The work of Colonel Giles is a striking indication of the rapid progress which the study of these insects has made during the last decade. He divides his book into two practically equal sections,—Part I, General, and Part II, Systematic. After discussing the position and terminology of the *Culicidae* and their collection, preservation and observation, he takes up first the anatomy of the larvæ and their generic characters, then passes on to the anatomy of the pupa, following with the anatomy of the adult mosquito, and

*A Handbook of the Gnats or Mosquitoes, giving the Anatomy and Life History of the Culicidæ, together with Descriptions of all Species noticed up to the Present Day. By Lieut. Col. GEO. M. GILES. I. M. S. (Retd.). Second Edition. 8 vo. pp. xii, 530. Numerous illustrations. London. John Bale, Sons & Danielsson, Ltd. 1902.

takes up the life history and seasonal prevalence of the mosquito and, after an exhaustive chapter on the conditions influencing the prevalence of mosquitoes including the prophylaxis of malaria, he closes with a consideration of the distribution of the *culicidae*. In Part II, after a short chapter on the classification of the Family, he takes up in the succession the five sub-families, the *Megarhinna*, the *Anophelina*, the *Culicina*, the *AEdomina*, and the *Corethrina*. The various sub-families include over 150 forms distributed among twenty-four genera. Fifty-one varieties belong to the *Anophelina* sub-family alone.

THE ESTIVO-AUTUMNAL MALARIAL FEVERS.*

THE discovery by Laveran, that malarial fevers were due to a plasmodium infecting the blood corpuscles and the elaboration of this discovery by others of the different form of the parasite rendered the diagnosis of these fevers easy. The natural outcome of these discoveries was to stimulate research as to the methods of infection. The best efforts of the profession were devoted to this purpose. "To Ross, Daniels, Manson and others the world is indebted for the knowledge of the new etiological factor in the production of malaria, i. e., the mosquito."

The author with his wide experience, and the immense amount of material, gathered and classified in his services in the various army hospitals, during the campaigns in Cuba and the Philippines, in connection with these discoveries, has produced a monograph on the Estivo-Autumnal fevers that is classical.

The facts leading up to the discovery by Laveran; the various forms of the plasmodium, illustrated by two full page plates, in the different types of the fever; the life cycle in man and the mosquito, are fully traced and described. The clinical descriptions, illustrated by various charts are terse and clear, giving a picture of the different forms of the disease as seen by an expert.

Full directions for general and special prophylaxis are given

**The Estivo-Autumnal (Remittent) Malarial Fevers.* By CHARLES F. CRAIG, M. D., U. S. A. 8 vo. pp. x, 221. 2 colored plates and 21 clinical charts. New York, William Wood & Co., 1901.

and the various modes of administering quinine described. The increased responsibilities, to the profession generally, resulting from the annexation of the various islands, and with them, their fevers contracted by soldiers enlisted from all parts of the country and returning to their native places suffering with these fevers, makes the book a most desirable acquisition to medical literature at the present time.

A. R. ALLEN.

ELEMENTARY HYGIENE FOR THE TROPICS.*

NOT the least important of the duties which have become imposed upon the *gringo* possessors of the islands which they have detached from Spanish domination, is the introduction of general and personal sanitation among the population of the new possessions. A most practical movement in this direction has been made by Major Ames in the preparation of this admirable textbook for use in common schools. Simple and lucid in style, accurate and up to date in material, logical and comprehensive in scope, its general adoption throughout the schools of our tropical dependencies will be attended with the greatest value to the nation. The altogether admirable text is well emphasized by a series of original and peculiarly appropriate illustrations, the whole forming a rare combination of the attractive and instructive.

THE TACTICS OF COAST DEFENSE.†

AWORK upon sea coast defense, adapted to the requirements of American military service, has long been required. The work of Major Wisser, recently editor of the *Journal of the United States Artillery*, has been directed along this line for many years and the present authoritative treatise is the result of his extended studies in this direction. Beginning with a note upon the

**Elementary Hygiene for the Tropics.* By Major AZEL AMES, M.D. 12 mo pp. 180, 70 illustrations. Boston, D. C. Heath & Co., 1902.

†*The Tactics of Coast Defense.* By JOHN P. WISSEr, Major Artillery Corps. 8 vo. pp. 232, with numerous maps and diagrams. Kansas City, Hudson-Kimberley Co., 1902.

principles of strategy and tactics, he proceeds to take up the subjects of armament, sites for batteries and forts, coast artillery material and the organization of coast artillery. This he follows by considerations upon instruction and training of the coast artillery, with an exhaustive chapter upon the battle tactics of coast defense, and concludes with a discussion of combined naval and land operations. Major Wisser does not fail in his work to give full credit to the important function of the artillery in case of coast defense and concludes his work with an expression of the opinion that the chief of artillery should have the rank of Major General, an opinion which will be cordially sustained by the officers, not only of the artillery but also of all other branches of the service.

ROSS ON MALARIA.*

THIS handbook is more especially designed for the use of the layman, rather than the medical man. Upon the title page the use is indicated, as "for travellers, sportsmen, soldiers and residents in malarious places." While this may be the writer's intention, the fact remains that it is a benefit to the profession as well. The well known ability of the author and his work along these lines has been such that anything upon malaria emanating from his pen is sure to be of value. The book gives a short history of malaria, its symptoms; describes the parasite and the methods of transmission from man to man, with a history of the mosquito, the different varieties and how to get rid of them; and methods of prevention, personal, and domestic, for factories and municipalities. The book, as its title indicates, is a desirable acquisition to the *materiel* of the sportsman, traveller, etc., and will fitly fill the niche for which it was intended by the author.

A. R. ALLEN.

**Malarial Fever, Its Cause, Prevention and Treatment*, containing full details for the use of travellers, sportsmen, soldiers and residents in malarious places. By RONALD ROSS, F.R.C.S., Etc. *Ninth Edition*, Revised and enlarged. Svo. pp. 68. 4 illustrations. New York, Longmans, Green & Co 1902.

REMARKS ON THE EFFECTS OF THE LUGER AND COLT'S AUTOMATIC PISTOLS.

By MAJOR LOUIS A. LAGARDE,

SURGEON IN THE UNITED STATES ARMY.

AUTOMATIC pistols for military purposes that employ jacketed bullets and smokeless powder have come up for trial by military surgeons, their use is indicated by the tactician, because (1) they are not so heavy by about one-half as much as the older pistols, (2) simplicity of mechanism, (3) lighter ammunition, (4) flatter trajectory, &c.

The important questions of penetration and stopping power have been left largely to the results of experimentation.



Compound comminuted fracture of femur by soft-nosed bullet,
Luger pistol, full charge. 5 feet; cadaver.

Penetration—The superior penetration of the projectile is favored by greater velocity and energy, and the fact that the bullet being jacketed seldom deforms on impact against resistant structures in the body. There is no doubt about the effectiveness of the weapon when it strikes a vital part because the energy of its projectile is so much greater than the resulting destructive effects will serve all the purposes of a firearm at close range.



Gunshot Wound of Left Forearm, with Fracture of Humerus, by 38 Caliber Colt's pistol. Full Charge; Jacketed Bullet; 5 feet.

The wound of entrance is circular, corresponding in diameter to the size of the bullet. The wound of exit is quadrilateral, 1 cm x $\frac{1}{2}$ cm. The bullet grazed the humerus at the junction of the middle and upper thirds. The specimen shows an attempt on the part of the bullet to gutter the bone, although the fracture is complete. The foyer of fracture is marked by the presence of three large spiculae of bone still attached to the periosteum measuring from 2 to 3 cm in length. There is no lateral displacement of fragments such as one would be apt to find in explosive effects.



Gunshot Wound of Right Forearm with Fracture of the Humerus by 30 Caliber
Luger pistol. 5 feet. Full Charge and Jacketed Bullet.

The wound of entrance is oval, 1 cm x $\frac{1}{2}$ cm. The wound of exit is 1 cm in length. The bullet comminuted the humerus 2 cm from the elbow joint. The foyer of fracture exhibits a great deal of bony sand and 4 loose spiculae of bone ranging from $\frac{1}{2}$ to $1\frac{1}{2}$ cm in length, and 2 larger spiculae 2 x 4 cm in length still attached to the periosteum. The amount of lateral displacement of bony sand and loose fragments is not great, showing absence of explosive effects.



Perforation of Condyles of Femur. Luger pistol ball full charge. 15 feet. Cadaver.



Gunshot Wound of Left Thigh with Fracture of Femur by 30 Caliber Luger pistol Full Charge; Jacketed Bullet; 5 feet.

The wound of entrance is round, corresponding in diameter to that of the bullet. The wound of exit is marked by a slit 1 cm in length. The femur sustained a fracture at the junction of the middle and upper thirds. The foyer of fracture exhibits six spiculae of bone still attached to the periosteum, from 1 to 2 cm in diameter. The ball impinged upon one side of the bone making an attempt at grooving.

Stopping power:—The amount of the stopping power of these pistols has been debated a great deal, it should be remembered that this depends not only on the energy at the moment of impact but that it is likewise dependent upon the sectional area of the bullet. In the instances before us the Luger patterns of pistols carries a jacketed bullet of 2 diameters in length which seldom deforms on impact, of 30 calibers, weighing 90 grains, possessed with a velocity of 1027 f. s. at the muzzle. The Colt's



Gunshot Wound of the Right Thigh with Fracture of Femur by 38 Caliber Colt's pistol. Full Charge. Jacketed Bullet. 5 feet.

The wound of entrance is circular, corresponding in size to the sectional area of the projectile. The wound of exit is irregular, 2 cm at its greatest diameter. The area of comminution is located at the junction of the middle and lower thirds of the femur, and is marked by the presence of five loose fragments $\frac{1}{2}$ x 1 cm in length still attached to the periosteum. There is no lateral displacement of bone.

carries a jacketed bullet of 2 diameters also, not easily deformed, of 38 calibres, weighing 105 grains, possessing an initial velocity of 982 f. s.

The revolver in use by our cavalry heretofore has varied between 45 and 38 calibers: The ball, composed of lead already greater in sectional areas was usually rendered larger still upon

impact with resistant structures which insured a correspondingly greater stopping power. It should be remembered that men in battle are called upon to use revolvers at close range against an



Gunshot Wound of Left Thigh with Fracture of Femur by 30 Caliber Luger pistol. 5 Feet. Full Charge and Jacketed Bullet.

The wound of entrance is round, corresponding in diameter to that of the bullet. The wound of exit is marked by a slit 1 cm in length. The femur sustained a fracture at the junction of the middle and upper thirds. The foyer of fracture exhibits 6 spiculae of bone still attached to the periosteum from 1 to 2 cm in diameter. The ball impinged upon one side of the bone making an attempt at grooving.

adversary often armed with a cutting or stabbing weapon like the sword or bolo. At such a critical moment the firearm should be most effective. A study of the effects of the Luger and Colt's



Gunshot Wound of Right Forearm with fracture of Humerus by 30-Caliber
Luger pistol at a distance of five feet, with full charge and Jacketed
Bullet.

The wound of entrance is oval, 1 cm x $\frac{1}{2}$ cm. The wound of exit is 1 cm in length. The bullet comminuted the humerus 2 cm from the elbow joint. The foyer of fracture exhibits a great deal of bony sand and 4 loose spiculae of bone ranging from $\frac{1}{2}$ to $1\frac{1}{2}$ cm in length, and two larger spiculae, 2 x 4 cm in length still attached to the periosteum. The amount of lateral displacement of bony sand and loose fragments is not great, showing the absence of what we usually designate under the term explosive effects.

missiles when striking vital parts, and the diaphyses of the long bones, would indicate that they have sufficient stopping power in all cases. On the other hand if the ball should happen to penetrate structures like the joint ends of bones, the lungs, and the soft parts, the effectiveness of stopping power becomes very questionable I believe that the illustrations and specimens here-



**Gunshot Wound of the Left Forearm with Fracture of
the Humerus by 38 Caliber Colt's pistol. Full
Charge; Jacketed Bullet; 5 feet.**

The wound of entrance is circular corresponding in diameter to the size of the bullet. The wound of exit is quadrilateral 1 cm x $\frac{1}{2}$ cm. As shown in the skiaagram the bullet grazed the humerus at the junction of the middle and upper thirds. The specimen shows an attempt on the part of the bullet to gutter the bone although the fracture is incomplete. The foyer of fracture is marked by the presence of three large spiculae of bone still attached to the periosteum, measuring from 2 to 3 cm in length. There is no lateral displacement of fragments such as one would be apt to find in explosive effects.

with go far to substantiate this view of the case and that army surgeons should be guarded in their recommendation of these weapons in place of the older and more effective revolvers.

THE NURSE CORPS OF THE ARMY.

By ANITA NEWCOMB MCGEE, M. D.,

LATE CONTRACT SURGEON IN THE UNITED STATES ARMY AND IN
CHARGE OF THE ARMY NURSE CORPS.

IN September, 1899, the present writer had the honor of presenting to the Association of Military Surgeons of the United States, a paper on "Women Nurses in the American Army." In it a brief account was given of the appointment of women trained nurses in the army, which began in May, 1898, and continued during the Spanish War at an increasing rate until the middle of September, when about 1200 were in the service. But the great volunteer army is now a thing of the past, and most of our regiment of nurses have returned to civil life. Between 1898 and the present time the trained army nurses have served in Porto Rico, Hawaiian Islands, China, Japan and Cuba, but in none of these places is there now any need for them. Their presence in the Chinese campaign, when they did heroic work at Tientsin and Pekin, served to show other nations an excellent example of the skilled care our country gives its sick and wounded.

Now that the army nurses have just left Cuba, a reference to their legacy to that island may not be amiss. Before 1898 nursing there was conducted much as it was in Europe in the middle ages, whereas now the system of national training schools, headed by ex-army nurses, is the model for the world.

The army nurse corps, as it exists today, is found at six large hospitals in the Philippine Islands (including about 30 nurses at the First Reserve in Manila) on the transport vessels, at the Presidio of San Francisco, (42 nurses), at the tuberculosis hospital of Fort Bayard, New Mexico (9 nurses) and from time to time at any post where they are temporarily needed. The total number is 167, of whom 123 are in active service and 44 classed as reserves.

The issue in June, 1899, of regulations governing our Nurse Corps was noted in the paper above referred to, but from time to time since then, as the need has arisen, the details of organization have been improved.

In December, 1900, the Department placed in the Army Reorganization Bill, which became a law that winter, a provision that the Medical Department should consist of certain officers, the Hospital Corps and the Nurse Corps, thus placing the trained women nurses on the same footing with the Hospital Corps, as an integral and permanent part of the Army—and consequently abolishing the contract system formerly in use. The section relating specifically to the nurses reads as follows:

SEC. 19. That the Nurse Corps (female) shall consist of one superintendent, to be appointed by the Secretary of War, who shall be a graduate of a hospital training school having a course of instruction of not less than two years, whose term of office may be terminated at his discretion, whose compensation shall be one thousand eight hundred dollars per annum, and of as many chief nurses, nurses, and reserve nurses as may be needed. Reserve nurses may be assigned to active duty when the emergency of the service demands, but shall receive no compensation except when on such duty: *Provided*, That all nurses in the Nurse Corps shall be appointed or removed by the Surgeon General, with the approval of the Secretary of War; that they shall be graduates of hospital training schools, and shall have passed a satisfactory professional, moral, mental, and physical examination: *And provided*, That the superintendent and nurses shall receive transportation and necessary expenses when traveling under orders; that the pay and allowances of nurses, and of reserve nurses, when on active service, shall be forty dollars per month when on duty in the United States and fifty dollars per month when without the limits of the United States. They shall be entitled to quarters, subsistence, and medical attendance during illness, and they may be granted leaves of absence for thirty days, with pay, for each calendar year; and, when serving as chief nurses, their pay may be increased by authority of the Secretary of War, such increase not to exceed twenty-five dollars per month. Payments to the Nurse Corps shall be made by the Pay Department.

The pay and allowances here specified are the same as were authorized early in 1899, but there is one important innovation in the provision for a "Superintendent" as the head of the Corps.

The prospect of this permanent arrangement enabled the writer (December 30, 1900) to resign her position as Acting Assistant Surgeon assigned to duty in charge of the Army Nurse

Corps, in the satisfactory knowledge that the pioneer work was a success, and that the trained nurse had proved herself as necessary to the best work of the doctor in uniform as she is to the doctor in civil life.

The army nurses' future welfare and successful work was however, to a degree, dependent on the woman to be appointed as Superintendent, and the choice fell on one of themselves in the person of Mrs. Dita H. Kinney, a graduate nurse from the Massachusetts General Hospital, and formerly Superintendent of several training schools, as well as Chief Nurse in the Army. The most important work of her administration has been an inspection tour of most of the army hospitals in the United States and Philippine Islands, at which nurses are stationed. As a result of this recent trip, several recommendations of special importance have been made, some of which have already been incorporated in the regulations. The most important of these provides for an examination in nursing, cooking, and allied subjects, the passage of which constitutes eligibility to the grade of Chief Nurse, provided executive ability has been proved. Examination for promotion, usual in other parts of the Army, is thus made obligatory in the Nurse Corps also.

A part of the work of trained nurses, noted in the previous paper as of special interest, was the employment of a skilled woman as instructor in practical cooking at the Company of Instruction of the Hospital Corps at Washington Barracks. This work has been so successful that this nurse now also teaches elementary nursing in as satisfactory a way as is possible in a brief period outside a hospital. In the opinion of the writer the trained nurses in the army might be used to a larger extent than at present as practical teachers of the enlisted men in the wards of certain large or base hospitals, just as in civil hospital wards the head nurses teach the juniors and prepare them in their turn to take increasing responsibilities and to perform their duties more skilfully. This is the method of the English system, where the "Sisters," as they are called, act only as head nurses, and at the large hospitals where they are stationed, they have the men under their instruction and orders. Their official grade is equal

to that of second lieutenant, and their social status that of officers.

Graduate nurses, who have had the benefit of a systematic three-year graded course in a large civil hospital, could, immediately on their army appointment, be given a special post graduate military course at a large hospital—either the one proposed to be located at Washington or at San Francisco—and at the same time could teach practical nursing *in the wards*, to the Hospital Corps recruits. Since it is not possible to obtain any considerable number of male trained nurses, such use of carefully picked trained women nurses of the *highest type* is by far the best way in which the recruits can receive a training. As they enlist for only three years—the same time the nurse has already spent in undergraduate work—and as part of their time is consumed in learning military duties from Surgeons and Stewards their training should be continued at the large or base hospitals so they may go into the field and to smaller posts well prepared for their work. The *permanent teaching* force of the Nurse Corps, including perhaps 100 nurses, should be of the highest possible standard, and should hold their positions virtually for life, as they do in England. They should be regularly stationed at certain specified hospitals, but whenever an officer at a smaller hospital needs them for an epidemic or a critical case, he should—as he now can and does—telegraph for two or more nurses to be sent from the nearest large hospital.

In addition to this permanent force, definite provision should be made for war reserves. The Army and National Guard will supply corps men for the arduous field service, but they cannot maintain a large enough corps to fill the needs of war emergency, with its large Army and large percentage of sick, and neither can they turn recruits into competent nurses in a few weeks.

Therefore, the civil profession of nursing must necessarily be called upon, and definite provision for this should be made in advance, so that our Government may never be dependent on haphazard aid. It is quite possible under existing law, and with present nursing conditions, for a large reserve nurse corps of perhaps two thousand nurses, to be gradually formed and maintained by admitting trained women nurses to our Army hospitals in a

constant succession of squads of such size as may be desired, for a special military postgraduate course. During their time of service, these nurses would supplement the work of the permanent corps, and on its completion, provided their fitness for the service is proved they should be placed upon the reserves, as they are at present. In emergencies these reserves are called upon, the chief nurses being taken from the permanent nurse corps.

The need of some such plan as this is the lesson of history; and if the American army is to retain its place in the front rank of the world's armies, it is plain that progress must follow the lines of experience gained during the Spanish-American war.

DISCUSSION.

Col. RICHARD EXHAM, R.A.M.C.: In the British Army up to the present we have only employed a very moderate number of nurses, at some of our large station hospitals. The experience that we now have of the employment of nurses has led to the employment of a very much larger number of nurses than hitherto and in much smaller hospitals than hitherto. I cannot speak too highly of the assistance we have had from nurses in South Africa. Without them our hospitals could not possibly have been carried on in the satisfactory way that they were. In general hospitals of about 500 beds we employed from 28 to 30 nurses and found that number none too many. These nurses were all obtained from our reserve that was formed for the war time. Previous to the outbreak of the war we had only a very small reserve that had never done military duty. There is now being formed a new scheme of nursing. It is called the Queen Alexandra Imperial Nursing Service, the rules for which are now being formulated but are not yet published. I have no doubt that within the next two or three months they will come out; and they will be the outcome of our war in South Africa.

Capt. MYLES STANDISH, M.V.M.: I want to endorse the paper as read, in one particular. That is the absolute necessity of teaching the men who are to serve as nurses in the wards of the hospital, and by trained nurses. I do not think that doctors are fit to teach nursing. I do not think that the nurses' school in civil hospitals is properly taught when taught by doctors as nowadays; it would be much better if by nurses instead of doctors. I know by experience that men learn readily from women nurses. I know that women nurses can teach them effectively; whatever one's preconceived opinions may be on that subject, he

has only to try it to be convinced. It is easy enough to teach men to make beds, and to do this and that, in the barracks, but to teach men not to do this, that and the other thing they ought not to do when they get into a hospital is something that cannot be done theoretically; but it can be done practically by the nurses who oversee them. I hope the Army will utilize the women nurses to teach its force of Hospital Corps men, and the thing will not depend on only one or two weeks of theoretical instruction by a nurse at Washington Barracks. It is just as important that these men should be taught nursing as cooking. You cannot teach a Hospital Corps man to be a proficient cook, proficient ambulance driver, first-aid man, ambulance corps man, and everything, in a month or six weeks, or six months. The Hospital Corps men should be taught, some of them as nurses and others as cooks, and known as such, and those that are to be taught as nurses should be taught by the women nurse corps, in my opinion.

Lieut. Col. VALERY HAVARD, U.S.A.: We had quite a number of nurses in Cuba. Unfortunately, in the first days of the campaign they had not been selected with very much judgment or care, and the result was very unsatisfactory. Many of them had to be eliminated, but we kept a certain proportion who did excellent work. In fact we had hardly any men nursing; the nursing in most of the hospitals was intrusted almost exclusively to female nurses, and whatever success was attained is entirely due to them. My idea has always been that female nurses should be by all means employed in large hospitals, at base hospitals, stationary hospitals, and possibly at field hospitals after the close of the campaign. But I doubt very much the propriety of introducing them into smaller hospitals. At the ambulance stations of course they are impossible. On the field of battle they are impossible. But their services can be utilized at least occasionally at the field hospitals, and always at the stationary hospitals. I do not believe that they should be employed at ordinary post hospitals where patients are comparatively few and can be attended to tolerably well by our Hospital Corps men. But in our large general hospitals nothing better can be done than to keep them.

Lieut. Col. J. K. WEAVER, Pa.: I have had some experience with women as hospital nurses. In the last war at Camp Meade where I was in charge of the Second Division Hospital, we had quite a number of severe cases of typhoid fever. It was practically impossible to get men who were reliable and in whose care the patients were safe. Men who were enlisted for that pur-

pose had no conception of what they were to do, and when they came to the camp and found they were soldiers first and then taught as nurses they became dissatisfied with their position and were unreliable to a great extent. The thought was conceived of establishing a separate hospital where the worst cases of typhoid fever were placed and put into the hands of nurses, some of them trained, but many who had come from private homes under contract. But what I wanted to say was the marked contrast apparent in a very short time. Having charge of both of those hospitals, it was apparent the moment you entered a hospital ward from the air of cleanliness and order which prevailed. While there were orderlies there to keep the floors clean and do the heavier work, they were under the control of these nurses; and there was evidence of good judgment and of care and neatness which was not apparent in the wards where men only were employed. I was greatly impressed with the superiority of women over men as nurses, because of the impossibility of getting men who could be trusted. My experience was that these men ordinarily could not be trusted with any severe cases, and I am greatly in favor of women nurses for hospitals, even for permanent field hospitals.

The PRESIDENT. (Lieut. Col. J. V. HOFF, U.S.A.): I think we will agree that God made the nurse and that she was a woman. But there are certain conditions under which the best cannot be had in military service. That the woman nurse has come into the army to stay there can be no doubt, and I believe that her relationship to the army must be determined clearly and her training must be on military lines. I think the scheme I ventured to outline very crudely in my address before the Association at the opening of this convention will have to be carried out in our great hospital and medical school that we hope to have some day in Washington, and in that school there should be a department devoted to the training of women nurses. Then when a war comes—I am not going to say it is coming very soon, I hope not—but when the war comes these nurses whom we have trained in our military hospitals become as it were the commanding or company officers of the nurses that we will take in from all the country round from the civil hospitals. They will be the chief nurses; they will give direction to the work; and then we will have a service from which all the confusion and the want of correlation that necessarily arose during the Spanish-American War will be eliminated.

LESSONS DRAWN FROM PRACTICAL PROFESSIONAL,
EXPERIENCE WITH TRAINED WOMEN NURSES
IN MILITARY SERVICE.

By JOHN W. ROSS, M.D.,

SURGEON (LIEUTENANT COMMANDER) IN THE
UNITED STATES NAVY.

IN this paper by the terms *nurses* and *trained nurses*, women are always meant.

In the earlier part of 1899 I had clinical charge of the patients in Military Hospital, No. 1, Havana, during the reorganization and Americanization of that institution. It was the chief military hospital of Cuba under the Americans, as it had been under the Spaniards. By the Spaniards it was called Hospital Alfonso XIII. At this hospital, I had serving under me from 20 to 30 nurses, nearly all of them graduates of good training schools in different parts of the United States, from New York to New Orleans. In 1900, I was placed in charge of the Department of Charities and Hospitals of the Province of Havana, my most important duty being reorganizing and modernizing the municipal hospitals, which had become woefully run down and demoralized under the last years of the Spanish rule. In one of these, Nuestra Señora de las Mercedes, we had established a training school for Cuban nurses, under the superintendence of a most capable American trained nurse. She was afterward assisted by several other American nurses. In 1901, and up to the end of the American occupation, May, 1902, I was in command of Las Animas, the yellow-fever hospital of Havana. At Las Animas, there was on duty, during my incumbency, about 20 nurses,—not all at the same time, the average being from 8 to 10. The work of these nurses was both arduous and dangerous. I personally treated nearly all of the patients while at Hospital No. 1, and so, had control of the nurses in their clinical work. At

Las Animas, I had entire charge of them, both clinically and executively.

This preamble is to show that I have had favorable opportunities to gather facts and draw conclusions about trained nurses in active military service.

The nurses who went to Cuba at the beginning of the late war with Spain were not selected with any particular care. On the contrary, the demand was so great and urgent that almost any respectable woman, professing to understand nursing, and willing to go, was sent. Among them, however, were a number of the very best equipped and capable nurses in the United States.

Of the 40 to 50 nurses with whom I was professionally associated so closely, 2 or 3 turned out to be incompetent, professionally or otherwise, and had to be gotten rid of; 3 or 4 others found themselves less adapted for military than for civil work; and gradually dropped out. But the large majority were excellent and most useful—admirably suited for the work, and the work for them. To this majority, as a whole, the following remarks apply.

They proved to be from a decidedly higher class of society than that from which male nurses come, well bred and fairly educated—the daughters and sisters of doctors, lawyers, clergymen, commissioned officers, and prominent business men. They respected themselves and commanded the respect of the men, patients and others, with who they came in contact. They were well liked by the hospital-corps men and other male attendants, who, when not prompted to the contrary, recognized the superiority of the trained women nurses and assisted them willingly. The nurses appreciated this and showed little or no tendency to impose upon the male attendants—cheerfully assisting those who wished to learn of them.

I found it advisable, everywhere, that the nurses should be supplemented by male attendants; the latter to do the heavier, unskilled work. In this way, the nursing of a hospital would be properly done with comparatively few trained nurses. It is demoralizing as well as poor economy, to have a skilled employee at \$50 a month, consume her valuable time at menial labor, such

as carrying slops, washing dishes, etc., which may be done equally as well by unskilled attendants, at less than half that pay.

The nurses on duty should always have the full charge and responsibility of their wards being next in authority to the medical officer. Women are now placed as head nurses in each male ward in Bellevue Hospital, New York City, over the men nurses.

No instances of improper relations between the sexes occurred among the nurses and men with whom I was associated in Cuba. There was no trouble about having the venereal cases properly cared for; the nurses attended to everything except the dressings which were satisfactorily done by the male attendants, or by the patients themselves. Without being immodest, the nurses were not squeamish. They handled the patients remarkably well, lifting them about in bed, giving them general baths, changing their clothing, etc., with apparent ease to themselves and comfort to the patients. They had a knack about it which they had learned in their training—more a matter of skill than of physical strength.

I was impressed by their endurance and capacity for going without sleep. As one instance, out of many, I cite that of a not-overly-strong nurse from New Orleans, who, with apparently no injury to herself, sat up all night for six weeks—sleeping very little during the day—with an extremely ill child-patient at Las Animas. They did not resort to stimulants when worn out. There was very little sickness among them, considering the amount of work, loss of sleep, anxiety, mosquitoes, and hot weather, to which they were subjected. I found them truthful, temperate, clean, orderly, loyal, and obedient. Their heart being in their work, they were cheerful and contented, getting along well with one another; especially when they had plenty of work to do. The effect of their presence was excellent upon the morale not only of the patients, but of all around them, antidotal to nostalgia and discouragement. They were greatly preferred by the patients over any other kind of nurses. They proved a veritable blessing to the overworked medical officers, saving them much time, relieving them of much anxiety, and preventing their being turned out unnecessarily at night.

They took deep interest in their dangerously-ill patients and showed remarkable talent for keeping them from dying. At the close of my service at Military Hospital No. 1, we had gone for over a month without a death, although we had a number of bad cases, nearly all typhoid (at one time 17 in one ward), some half-dozen of them extremely ill. I am confident that but for the trained nurses, several of these typhoids would have died during that month. I understand that they all recovered ultimately, except one or two who died in relapse. According to Mr. Burdett-Coutts, M. P., we learn from the English South African Hospital Commission, that, in the late war with the Boers, during an epidemic of typhoid fever, the Volks Hospital was the only one at Bloemfontein provided with female nurses. There was no trained orderly in said hospital and all the nursing in it was done by the matron and a staff of eight female nurses. "It had to deal with the epidemic under the same conditions of pressure, climate, provisions, water, and other matters, as the rest of the hospitals around it." It received the same class of patients. "The general enteric mortality was 21 per cent. The same mortality in the Volks Hospital was 7.75. This is the best practical proof that could be given of the value of female nursing of sick and wounded soldiers."

I was surprised by the resourcefulness of the nurses. When our troops first landed at Mariano, near Havana, a detachment of them was turned loose in a field where practically nothing had been prepared for their accommodation—no tents, no anything. They "hustled around," took care of themselves, and stood the exposure, quite as well as the same number of the stronger sex would have done. Major Gorgas, of Havana fame, informs me that during the latter part of the Santiago Campaign in 1898, he commanded the large base hospital at Siboney, Cuba, immediately in the rear of our army. This hospital was necessarily a rough affair with practically no facilities for the care of any except the sick and wounded. In it he had about 50 women nurses, nearly all of them untrained; and about 500 male attendants, all soldiers. The 50 women did all the extra-diet cooking, and brought the wards to a greater state of efficiency, and did better nursing, than the men could possibly have done. He was sur-

prised that these women kept in such good health, none of them being seriously ill, although for the first night or two, they slept upon the ground, and, all the time, had the same kind of food, shelter, and bedding as the men.

It is bad for all concerned to mix graduate with non-graduate women nurses. They are about as incompatible as are physicians possessing and those not possessing degrees. Nurses object strongly to being called *female* nurses, a prejudice possibly derived from the French, who do not apply the corresponding word, *femelle*, to human beings. In the U. S. Army they are styled simply *Nurses*, and their organization the *Army Nurse Corps*.

I found that the efficiency of trained nurses depended largely upon the kind of treatment they received. When treated justly, kindly, respectfully and appreciatively, there was hardly any limit to the amount of work they would do, or the hardships they would suffer, well and cheerfully. Like girls at school they were easily stimulated to their best by commendation and encouragement. This method can be applied to *women* without subversion of discipline. Trained nurses take to discipline very kindly. In civil life a great many of them prefer hospital to private work, and those I have served with in the Army, like the duty in military better than that in civil hospitals.

On many occasions during the Spanish-American war the nurses showed heroism and devotion to duty equal to that of any soldier or sailor in battle. The majority of those with me at Las Animas Hospital, had not had yellow fever, yet, they all unflinchingly nursed the malignant cases of that disease, staying by those who died, to the very last; trying to alleviate suffering and save life, their clothing, hands, and sometimes their faces, smeared with blood and black vomit. One of those Las Animas nurses, Miss Clara Maass, gave up her young life from a high sense of duty. She thought she would be more useful in Cuba, as a nurse, after having had yellow fever, and requested to be bitten by infected mosquitoes in order to contract the disease and become immune. I tried to dissuade her from the step, telling her that her life was too valuable to be exposed to such great risk—practical certainty—of taking yellow fever. Nevertheless, she insisted, and the fatal mosquitoes were applied to her arm. Three

or four days later, she developed a malignant, hemorrhagic case of yellow fever, from which she died in about a week. She was buried with military honors.

The recent General Order from Major General Chaffee, commending the "bravery and conscientious performance of duty," of Nurse Alice Kemmer, Army Nurse Corps, and extending to her his "sincere appreciation of her noble conduct"; proves that the same heroic spirit prevails among the trained nurses in the Philippines. The General Order referred to, sets forth that, "Nurse Alice Kemmer, Army Nurse Corps, having been granted leave of absence, voluntarily relinquished the same and took upon herself the care of two small-pox patients in an isolation hospital connected with the First Reserve Hospital in this city; one of the patients was the wife of an officer, the other an enlisted man. Miss Kemmer had never had the disease, nevertheless she fearlessly entered upon her self-imposed task, and throughout the months of April and May, 1902, devoted herself to the care of the patients, living in the room with the officer's wife, the enlisted man being in an adjoining room. With never more than two hours' sleep at a time, in intensely hot weather, the nurse attended her patients day and night and saved their lives."

For a dozen or more years prior to the breaking out of the Spanish-American War, I had had experience with trained nurses in private practice, sanatoria, and civil hospitals, and had, like my other confreres, found them essential to the attainment of good results. But, having had no personal knowledge of them in military life, I looked upon them as, with rare exceptions like Florence Nightingale, undesirable in the Army or Navy. To-day, after my service with the Army in Cuba, my conviction is, that valuable as trained nurses are in civil institutions, they are even more so in military hospitals. Like all women, they "love the military," enjoy military surroundings, ceremonies, titles, uniforms, etc. They are stimulated thereby to greater interest and pride in their duties. In modern military hospitals, the trained nurse is not only desirable, but indispensable; not only a necessity, but a luxury; not only useful, but ornamental.

Rear Admiral Rixey, Surgeon General of the Navy, in his annual report, dated October 1. 1902, to the Secretary of the Navy; strongly recommends the establishment of a Woman Nurse

Corps for the Navy. Among other wise observations upon the subject he makes the following:

"That women are the superior of men for the work of nursing, there can be no question, and the objection that they are not compatible with military conditions can scarcely apply to institutions of the character of our large naval hospitals. Civil hospitals in every country employ women to do the nursing, and for no other reason than that they fill the position of nurse better than men..... It is believed that just as good results can be obtained from the use of women nurses in naval hospitals as in civil, It can be stated with assurance that if the patients were given their choice of a nurse they would select women in the large majority of cases."

The Annual Report of the Surgeon General of the Army (Brigadier General Forwood), for the fiscal year ending June 30, 1902, contains the following sentence: "Of the 119 members of the Army Nurse Corps now in service, 63 are in the Philippines and 56 in the United States. The nurses seem to have made a place for themselves in Army hospitals, and chief surgeons and commanding officers speak in high commendation of their services and conduct. One of the latter writes that 'the nurses are entitled to the greatest praise and consideration'."

Col. Charles R. Greenleaf, assistant surgeon-general, U. S. Army, Chief Surgeon, Division of the Philippines, in a letter addressed to the Adjutant-General of the Division, May 21, 1900, says: "The female nurses have done excellent service..... Their influence on the sick and on the well has been a good one, and they have, as a rule, been discreet in conduct, amenable to discipline, and possessed of professional ability of a high order."

About the first of February, 1902, the Chief Surgeon of the Division of the Philippines summoned all the medical officers in Manila to a conference, and there asked if they could not run their hospitals without the female nurses. This inquiry was *unanimously* answered in the *negative*.

The incidents of the war of the Crimea, demonstrated to the Medical Department of the English Army the value of female nurses in army hospitals; and since that time they have formed a part of the military establishment of that country. The Lancet, in its issue of April 27, 1901, says: "Without skilled female nurses, the proper care of the sick cannot be accomplished, and

it will probably be necessary, even under ordinary conditions, to increase the existing establishment. It will certainly be so in the event of war on any large scale." Since that writing the entire English Army Nursing Service has been reorganized, and, following the example set by our army, a Superintendent has been appointed. They have even improved on our methods by having an "Advisory Council," made up of the Superintendents of the leading Training Schools of Great Britain.

It seems to me that the medical officer who, having within the last four years served in the Army or Navy with trained women nurses, remains honestly opposed to their permanent and extensive employment in military hospitals, must be a direct descendant of the old Scotchman who thanked the Lord that he was not open to conviction.

THE FIRST ARBITER IN NAVAL SERVICE.

IN the *Boston Evening Transcript* of September 20, 1902, is an article by Winthrop Packard, entitled "The Tender Battleship." The author gives due credit to the good work done by the Admirals, other officers and the "man behind the gun," but lays stress upon the part played by the Naval Constructor, as the man behind the efficiency of the whole fleet, and worthy of far more praise than he usually receives.

In this connection we beg to call attention to a section of Naval men whose services seem to be unknown to our friends, the critics. We refer to the members of the Medical Corps of the Navy. Every person who enters the Naval service of the United States must pass an examination by a Board of Naval Surgeons. Here, then, is the first arbiter, the Naval Medical Officer, whose knowledge, (acquired by study and experience) of physics, physiology and facies, enables him to select those who are best fit, in body and brain, to become Midshipmen and Admirals, the "man behind the gun," and Naval Constructors. "Quietly, unostentatiously he does his work"—if we may thus use the words applied by Mr. Packard to Naval Constructors.

Among the many matters of Sanitation coming under the direction of the Naval Surgeon, the most important duty, surely, is the examination of persons for military service. Prevention is better than attempts at repair.—*JUSTITIA.*

THE MOST PRACTICABLE ORGANIZATION FOR THE
MEDICAL DEPARTMENT OF THE UNITED
STATES ARMY IN ACTIVE SERVICE.

By CAPTAIN FREDERICK P. REYNOLDS.

MEDICAL DEPARTMENT OF THE UNITED STATES ARMY.

Part Two.

THE MEDICAL DEPARTMENT ORGANIZATION ON THE
LINES OF COMMUNICATION AND AT THE BASE.

Hospitals.
Transport.

Supply Depots.
Reserve Personnel.

HOSPITALS. "The evacuation to the rear of the sick and wounded forms the basis of the military medical service in the field, the essentially military function of the medical officer being to free the front of the army from these *impedimenta*." The hospitals for this service are stationary in character and are located according to certain general rules well established by long experience. This division of our subject has undergone few changes under modern conditions of warfare, differing in this respect from the service at the front.

For the purpose of evacuation of the wounded to the rear, stationary hospitals are established as near to front as possible. As the army advances other stationary hospitals are established near the front. One is located wherever the nature of the sick transport is changed, and at the end of each day's journey by wagon or bearer transport, or by rail or water transport if the trains or boats are not organized and equipped to care for their sick and wounded.

The stationary hospital is often required to be established with the utmost despatch and at localities away from railroads and where buildings and other conveniences do not exist. It is therefore necessary that the stationary hospital should have an equipment complete and sufficient to make it possible to establish and maintain itself independent of its surroundings. It follows that to meet these requirements the stationary hospital should have a fixed size and a definite personnel, organization, and equipment. The most desirable size for such a hospital may be said to be 400 beds. Convenience of administration, segregation of the wounded, and other considerations too numerous to mention have established the general rule that 500 beds should be the limit for stationary military hospitals.

Fixing the desirable size of stationary or base hospitals at 400 beds, we may next determine upon the quota of personnel needed. The mean allowance for most armies (which includes that of our own during the civil war), is 10 medical officers, 5 other officers, and 95 noncommissioned officers and men (Hoff). The accuracy of the figures for our base hospitals during the civil war has been doubted as there was no established allowance and the number of men detailed for hospital duty was probably larger than the figures show. According to the data obtainable the usual quota was but 72. That of Great Britain, the conditions of whose service most resembles ours, is fixed at 140.

The experience in base hospitals in the Philippines is of value in deciding this question. A personnel sufficient for the needs of base hospitals under the conditions of climate and surroundings which our service has encountered there would without doubt be sufficient for almost any future campaign. In August, 1900, it was found that the proportion of Hospital Corps on duty in base hospitals in the Islands averaged about $26\frac{1}{2}\%$ of the total bed capacity. In hospitals where they formed part of the personnel, the proportion of female nurses was about $5\frac{1}{2}\%$. The proportion of native employes was about 7%. At the time the number of Hospital

Corps men in the division was below the needs and it became necessary to fix an allowance for each hospital. The total allowance for a 200 bed hospital was 33% of its bed capacity of which number 21% were Hospital Corps men, 5% female nurses, and 7% native (civilian) employes. In those hospitals where female nurses were not employed an equal proportion of Hospital Corps was allowed in addition. This allowance was found to be barely sufficient in nearly all hospitals and was lacking in a reserve to meet emergencies.

For active service the personnel of a stationary hospital should be ample for all duties and should be sufficient to successfully meet an emergency taxing it to its full capacity. The increased liability of sickness in the personnel must also be considered. With these points in view, it is believed that the allowance of Hospital Corps for a 400 bed stationary hospital (in two independent sections) in active service should be 33% of its capacity, and to be able to meet all requirements of service which might reasonably be expected. With such a personnel it could operate to its full capacity independent of female nurses and civilian employes which of course it might at any time be called upon to do.

The allowance of female nurses would ordinarily be 5%-7% of the bed capacity and they should be considered part of the personnel in all stationary hospitals where the conditions will allow. Native help is necessary in the tropics and is economical for much of the menial work about a hospital. Skilled civilian labor may also be available and it may be advantageous to employ it. Under ordinary conditions 5% is a liberal allowance of civilian help.

The number of medical officers allowed a stationary hospital is believed to be liberal and sufficient to meet the requirements. In hospitals where the work is light and where there is little probability of their being operated to their full capacity, some medical officers might of course be assigned to other duties. The same may be said of the rest of the personnel. It is thought, however, that a definite allowance of personnel should be fixed, which allowance is to be considered as the personnel usually necessary for field conditions.

OUTLINE OF THE ORGANIZATION OF A STATIONARY OR
GENERAL HOSPITAL.

400 beds in two sections of 200 beds each.

12 Medical Officers; 1 Quartermaster; 24 Female nurses; 1 Hospital Corps Company of 135 men—22 noncommissioned officers; 1st Sgt., 7 sgts., 14 corporals, 113 privates. 68—1st class, 45—2nd class privates.

MEDICAL OFFICERS.

1 in command (Major).

1 executive officer (Captain).

1 commanding Hospital Corps Company (Captain or Lieutenant), details, company records, funds, mess, etc.

9 ward surgeons (Captains or Lieutenants).

DUTIES OF OFFICERS.

COMMANDING OFFICER.

General supervision, Records, reports, and returns.

EXECUTIVE OFFICER.

General supervision under Commanding Officer. Summary Court. In immediate charge of Records and Reports. Admissions and discharges.

PROPERTY AND MESS OFFICER.

Hospital messes and kitchens, (store-rooms). Funds, laundry, and disinfecting plant.

Medical property and store-rooms. Reports and Returns relating. Patients' effects.

QUARTERMASTER.

Usual quartermaster duties.

Rations and commissary stores. Ordnance Officer.

NONCOMMISSIONED OFFICERS.

1 First sergeant.

1 quartermaster and commissary sergeant.

1 police and stable sergeant.

2- 1 in charge of hospital mess—each section.

2- 1 in charge of dispensary and medical property—each section.

2- 1 in charge of hospital wards. Sergeant of records—each section.

2- 1 in charge of operating room—each section.

8- 4 wardmasters—each section.

1 in charge company property. Company clerk.

2 supernumeraries.

DISTRIBUTION OF PRIVATES.

(Each Section).

Orderlies:

C. O., and Executive Officer,.....	2
Dispensary,	2
Records:	
Stenographer,.....	1
Hospital Fund and Mess,.....	1
Sick and Wounded, Transfers, and patients' effects,.....	4
Correspondence,	1
Room Orderlies,.....	2
Kitchen and Dining Room: baker, 1; diet cooks, 2; hospital cooks, 4; Hospital Corps cooks, 2,.....	9
Linen room and medical store-room,	1
Quartermaster and Commissary store-room,.....	1
Patients' effects,.....	1
Operating room,.....	3
Carpenter,.....	1
Sinks and Baths,	1
Disinfecting room and dead-house,.....	1
Wards,.....	16
Police, fire apparatus, hauling, etc., hostlers, drivers, (for this duty men may be detached from an ambulance company),.....	7
Miscellaneous,.....	4
Trumpeter,	1
Total,.....	56
Female nurses.....	12

As the stationary hospital is the first place where the sick and wounded receive careful attention, its equipment should be ample for all reasonable needs.

For hospitals at the front and on the lines this equipment must be arranged with a view to facility in packing and unpacking and should be chiefly in chests and cases. The admirable "unit system" for packing medical supplies devised by Captain Munson of the Medical Department, U. S. Army, will do away with the inconveniences of former methods of handling and transporting these supplies and will make packing boxes as convenient as chests. Tents or portable hospital wards are to be included, whenever suitable buildings are

not available. An X-ray apparatus is almost a necessity in such hospitals.

It is not considered that stationary hospital equipment should be considered in detail in this essay. The equipment should be definitely laid down in the supply table and the stationary or base hospital for active service should be considered as one of the units of the field organization.

Hospital accommodation should be established at the base of operations of an army in campaign. This hospital accommodation should be of a capacity for 3% or 4% of the army, the amount depending on the "country, season, climate, nature of the contest, and above all on the provisions for the removal of the sick and wounded," to the general hospitals at home. One-half of a stationary hospital established at the base would provide for over $3\frac{1}{3}\%$ in sick and wounded of an infantry brigade of full strength, and would probably be of sufficient capacity for an expedition of that size. The other half of the hospital might be held in reserve or established on the lines of communication as the expedition advances. Considered generally, we may state that a hospital or hospitals at the base should have in reserve a bed capacity for 2% to 4% and those on the lines 1% to 2%, making a total bed capacity at the rear of 5% to 10% according to the conditions of the campaign.

TRANSPORT.

"Experience has demonstrated that the success of military medical administration is almost wholly dependent upon the lodgement of the power to do in the same hands with the responsibility for doing. Division of authority entails weakness of administration, for it is human nature to place responsibility for unhappy results on other shoulders if possible. For that reason, the Surgeon General of the Army should have entire control of such transportation as may be required to move the sick and wounded from the field to the base or general hospitals." (Pope).

While space does not permit an elaboration of this feature it is the wish of the writer to call attention to its importance

and to the partial recognition of it which eventuated in the introduction of the much needed hospital ship and hospital train as the first step and it is to be hoped only an initial one in the line of advancement. That the Medical Department should have complete autonomy within its sphere of action, the experience of all modern wars has conclusively shown.

The amount of sick transport which is needed to the rear, can only be decided by considering the conditions of each campaign, and therefore no general estimate can be given. Sick and wounded are carried from field hospitals by rail or water, by wheeled transport, in ambulances, and by farm wagons and carts; by horse and mule litters and cacolets; and by bearers on foot. In rough countries where wheeled vehicles cannot be used, the use of native litter bearers has proven to be the most satisfactory form of sick transport.

For the Ashanti Campaign arrangements were made "for sending back daily to the base of operations sick or wounded at the rate of 1% of all the British soldiers employed at the front." (Wolseley). The climate is described as being one of the worst in the world.

A hospital train for 240 patients (in 10 "tourist" cars) requires as personnel 3 medical officers, 10 non-commissioned officers, and 50 privates. This personnel might be detached from a reserve ambulance company at the base. The equipment would be the medical, surgical, mess, food, and bedding supplies of a stationary hospital. Most of the other supplies would probably be specifically designed for the conditions of this service and will not be considered here.

Sick transport by water usually forms part of the work between the front and the base and between the base and general hospitals at home. A hospital ship for 200 patients would require about the same amount of personnel as a hospital train. Its equipment is outside the limits of the essay.

THE MEDICAL SUPPLY DEPOT at the base and that at the extreme front on the lines (advance supply depot), each require 1 medical officer, 2 non-commissioned officers, and 10 privates as personnel.

Midway in each day's journey from the front by wagon or bearer transport, a "rest station" should be located with a medical officer, 1 non-commissioned officer and 2 privates.

A reserve ambulance company at the base could furnish 3 medical officers, 10 non-commissioned officers, and 50 privates as personnel of a hospital train; 2 non-commissioned officers and 10 privates with medical supply depot at base, and the same number with the advance medical supply depot, and leave 2 medical officers, 8 non-commissioned officers, and 40 privates for transport and other duty at the base and on the lines, including the rest stations.

THE ADMINISTRATION AT THE BASE.

- 1 Chief Surgeon on the staff of the commanding general at the base
- 2 Medical Supply Officers.
- 1 Medical Officer in charge of transport.

The convalescent depot at the base should be under command of a line officer, forming part of the casual camp. It should be under the immediate charge of a medical officer.

The executive and administrative duties of the Medical Department at home, and the general hospitals, hospital trains, hospital ships, and other units of the organization there, have not been considered except in so far as they relate to the field organization. The organization of general hospitals at home does not materially differ from that of the hospitals at the base of military operations in the lines toward the front. The same may be said of hospital trains and ships.

The organization of an army medical school and a nurses' training school are likewise beyond the limits of a paper on medical department organization for field service.

ORGANIZATION FOR THE MEDICAL DEPARTMENT OF THE U.S. ARMY IN ACTIVE SERVICE.

Based on the conclusions of the preceding pages, the following field organization for the Medical Department of the United States Army in active service is presented for consideration.

ORGANIZATION OF THE MEDICAL DEPARTMENT OF A
BRIGADE OF INFANTRY. ABOUT 5700 MEN. THREE
REGIMENTS OF 1886 MEN EACH.

ADMINISTRATION.	TOTAL.			
	M.O. 1	N.C.O. 1	PVTS. 1	H.C. 2
Brigade Surgeon, (Major)				
FIRST LINE.				
With regiments.	9	9	36	45
SECOND LINE.				
1 Ambulance company,	5	22	113	135
THIRD LINE.				
1 Field hospital,	5	13	62	75
Total at the front:—	20	44	211	255

ORGANIZATION OF THE MEDICAL DEPARTMENT OF A
DIVISION OF ABOUT 13000 MEN.

6 Infantry regiments (2 brigades), about,	11400
1 Cavalry regiment, about,	1300
1 Battery field artillery,	163
1 Company of engineers,	107
	12970

ADMINISTRATION.	TOTAL.			
	M.O. 1	N.C.O. 2	PVTS. 2	H.C. 3
Hospital Corps with administration is included in personnel of ambulance companies.				
1 Division Surgeon, Lt. Colonel,				
2 Brigade Surgeons, Majors,	2	2	2	4
FIRST LINE.				
With regiments,	21	21	81	102
With field battery,	1	1	1	2
SECOND LINE.				
2 Ambulance companies,	10	44	226	270
THIRD LINE.				
2 Field hospitals,	10	26	124	150
Total at the front:—	45	92	432	524

ORGANIZATION OF THE MEDICAL DEPARTMENT OF AN
ARMY CORPS OF ABOUT 28000 MEN.

2 Infantry divisions (of 2 brigades each), about,	22800
1 Cavalry brigade (3 regiments), about,	3900
6 Batteries field artillery, about,	980
3 Companies of engineers, about,	320
	28000

ADMINISTRATION.	TOTAL			
	M.O.	N.C.O.	PVTS.	H.C.
Hospital Corps included in personnel of ambulance companies.				
Corps: 1 Chief Surgeon, Colonel,	2	1	3	4
1 Executive Officer, Captain,				
Divisions: 2 Surgeons,				
Lt. Colonels,	2	2	4	6
Brigades: 5 Surgeons,				
Majors,	5	5	5	10
FIRST LINE.				
With 12 Infantry regiments,	36	36	144	180
With 5 Cavalry regiments,	9	9	25	36
With 6 Batteries of field artillery,	6	(6)	(6)	(12)
With 3 Companies of engineers,	1	(1)	(1)	(2)
SECOND LINE.				
4 ambulance companies with infantry brigades,	20	88	452	540
1 ambulance company with cavalry brigade,	5	18	72	90
THIRD LINE.				
4 field hospitals with infantry brigade,	20	52	248	300
1 field hospital with cavalry brigade.	4	7	37	44
1 field hospital in reserve,	5	13	62	75
Total at the front:	115	223	1042	1265

ARMY CORPS OF ABOUT 2800 MEN.
MEDICAL DEPARTMENT ORGANIZATION ON THE
LINES AND AT THE BASE.

ADMINISTRATION AT THE BASE.	TOTAL			
	M.O.	N.C.O.	PVTS.	H.C.
Hospital Corps belongs to ambulance company.				
1 Chief Surgeon, Lt. Colonel,	1	1	2	3
2 Medical Supply Officers, Majors,	2	4	20	24
1 Medical Transport Officer, Major,				
FOURTH LINE.	1			
3 stationary hospitals at the base,	36	66	339	405
1 stationary hospital on the lines,	12	22	113	135
1 ambulance company for transport duty,	5	22	113	135
Total:	57	110	566	675

	At the front.	On lines and at base.	Total.
Medical officers per one thousand troops,	4	2½	6½
Hospital Corps % of troops,	4½%	2½%	7½%
Number of Beds in hospitals,	840	1600	2440
Number of Beds in hospitals % of troops,	3%	6%	9%

NOTE:—The needs at the base varying according to the conditions to be met with in each campaign, the quota of hospital accommodations and sick transport personnel as here given is not fixed and arbitrary but would necessarily fluctuate to meet the requirements dependent on season, climate, distance troops are from base, and similar factors.

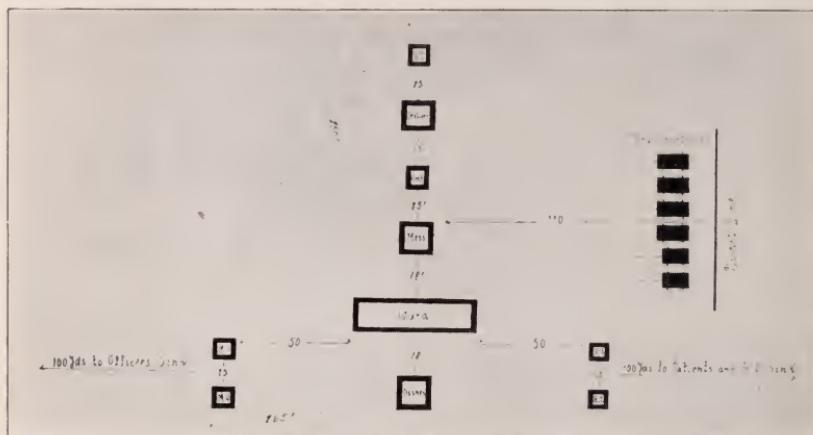


Fig. 1. Plan for Pitching a Regimental Hospital.

In August 1900, there were provided for the sick of the Army in the Philippines in hospitals on the lines and at the base, 3500 beds for about 65000 troops or at the rate of about $5\frac{1}{3}\%$. There were in these hospitals at that time 2749 patients or about $4\frac{1}{3}\%$ and in regimental hospitals 1119 or about $1\frac{7}{10}\%$, the total number of sick in hospital being very nearly 6%. In addition there were 1261 sick in quarters (about $1\frac{9}{10}\%$); the total sickness in the Division therefore amounted to $7\frac{84}{100}\%$ of the troops. At this time the Army was changing from a field to a garrison status and regiments were widely distributed in order to occupy as much of the country as possible.

Fig. 2. Regimental Hospital pitched in accordance with Fig. 1.





Fig. 3. Regimental Hospital pitched in accordance with Plan in Fig. 1.

The Chief Surgeons of brigades, divisions, and corps should have supervision of the medical department of their organizations and should be responsible for its efficiency. In general the duties of all medical officers are as laid down in the Manual for the Medical Department, U.S. Army.

Requests for the guard to preserve order and to protect supplies at ambulance stations, field hospitals, and at other places where such protection is necessary, will be made to the commanding officer by the senior medical officer with a command.

THE BRIGADE SURGEON under direction of the brigade commander locates the field hospital and ambulance station and supervises the work at the aid stations of the brigade. He has as clerk and orderly a noncommissioned officer and a private, who ordinarily are detached from the ambulance company.

THE REGIMENTAL PERSONNEL consists of three medical officers, (a major, a captain, and a lieutenant), one sergeant, two corporals, and twelve privates belonging to a field hospital company.

The regimental hospital for infantry is of 18 beds. If needed its equipment may be increased to accommodate 3% of the command, or

more, should the regiment be operating independently. It may also be reduced to 12 beds by omitting one hospital tent. A plan for pitching a regimental hospital is shown in Fig. 1.

In the presence of the enemy, when rapid marches are made, or whenever other circumstances require it, the regimental hospitals are consolidated with the field hospitals, unless the regiments are isolated and not part of brigades. There then remain with each regiment, two medical officers, usually the major and captain, one non-commissioned officer, and two privates, with a dispensary equipment consisting of one detached service chest and one box of surgical dressings, besides one emergency case carried by the non-commissioned officer,—two orderly pouches, and one surgeon's field case. The chest and box of dressings, tents, and baggage are carried in the regimental wagons. The Hospital Corps men mess with some regimental organization. They belong to a field hospital company. One equipped ambulance with driver and orderly, detached from the ambulance company accompanies the regiment and follows immediately in its rear. The ambulance is under the control of the regimental surgeon. Forage for its animals is carried by regimental wagons.

Fig. 4. Twelve Bed Regimental Hospital.



EQUIPMENT OF 18 BED REGIMENTAL HOSPITAL.

WEIGHT WITH CRATES		WEIGHT WITH CRATES.
CHESTS:	Lbs.	Lbs.
1 Regimental Medical,	129	1 Spade,
1 Regimental Surgical,	133	4 Mauls,
1 Regimental Sterilizer,	120	4 Hospital tents,
1 Com mode,	60	1 Common tent,
1 Food, small, about	100	2 Litters,
1 Mess, small,	215	1 Field oven, small,
1 Emergency case.	4	1 Box dressings,
3 Surgeon's Field cases,	15	3 Brooms,
1 Field Desk,	135	2 Camp colors, on staff,
2 Blanket and Bedding cases,	240	1 Flag, "Red Cross", with halyards,
18 Folding cots, "Gold Medal",	360	2 Dippers,
1 Maignen Filter,	33	5 Agate hand basins,
3 Hatchets,	3	3 Scrubbing brushes,
5 Lanterns,	10	1 Nest of 3 agate buckets,
4 Galvanized iron buckets,	18	2 doz. Lantern wicks.

TRANSPORTATION.

1 Army wagon, four mule.

4 Ambulances if regiment is independent,—one if it is in a brigade. Officers' baggage and mess outfits are carried in headquarters wagons. Forage for animals by regimental wagon trains.

THE MEDICAL DEPARTMENT PERSONNEL WITH A BATTERY OF FIELD ARTILLERY consists of one medical officer, (captain or lieutenant), and one noncommissioned officer and one private of the Hospital Corps. One equipped ambulance from an ambulance company with driver and orderly accompanies the battery.

THE AMBULANCE COMPANY with its equipment marches in the immediate rear of the troops and in advance of the field hospital and the brigade wagon train. It furnishes transportation, shelter, and treatment for the sick and wounded on the march, and also in camp when for any reason it is not desirable to pitch a section of the field hospital. It acts in place of the field hospital when for any reason the latter is delayed or the shortness of the camp makes unpacking the hospital equipment inadvisable.

The organization of the ambulance company is as follows:

MEDICAL OFFICERS.

1 in command. (major).

1 executive officer (captain) in charge medical supplies and property.

3 ambulance surgeons (lieutenants).

NONCOMMISSIONED OFFICERS: 1 First sergeant, 7 sergeants 14 corporals.

- | | |
|---------------------------|-------------------------------------|
| 1 First sergeant. | 2 ambulance (sergeants). |
| 1 quartermaster sergeant. | 12 bearer (corporals). |
| 1 dispensary (sergeant). | 1 operating tent (sergeant). |
| 1 records (sergeant) | 3 others (1 sergeant, 2 corporals). |

PRIVATE'S:

- | | |
|-------------------------|----------------------|
| 15 ambulance drivers. | 1 water-cart driver. |
| 15 ambulance orderlies. | 5 orderlies. |
| 48 litter bearers. | 1 packer. |
| 4 cooks. | 1 blacksmith. |
| 2 trumpeters. | 1 saddler. |
| 4 wagon drivers. | 10 attendants. |
- 6 supernumeraries.

The company would ordinarily supply noncommissioned officers and privates for duty as clerks and orderlies with administrative officers and the Hospital Corps personnel with field batteries, etc.

EQUIPMENT FOR AN AMBULANCE COMPANY.

The ambulance at present in use (pattern 1900), carrying four recumbent patients in two upper and two lower berths, has many advantages over patterns previously issued and is probably the most practicable one for the needs of our service that has been supplied to our army. It, however, lacks convenient space for carrying surgical and food supplies. With the sheet-iron boxes, fastened beneath the body just forward of the rear axle, (a trial of which is now being made by direction of the Surgeon-General), this defect could probably be overcome. The "ambulance box of hospital stores" and the "ambulance box of surgical dressings" are to be carried by each ambulance. In addition to these boxes, each ambulance carries four litters, two water cans, an axe, a bucket, an ambulance guidon, and two lanterns—one red and one white.

Every fourth ambulance also carries a travois for use with an ambulance mule on occasions when the ambulance is unable to reach its destination at the front. With these articles, each ambulance has an equipment making it an independent unit prepared to meet the most necessary requirements of the wounded at the ambulance and dressing stations should the supply wagon be delayed or unable to reach the field of action.

Two pack mules are provided whose primary use is to carry forward the equipment for a dressing station at times when the supply wagon is unable to reach the front. With this equipment and the personal equipment of the bearers, (including litters), the most necessary attention to the wounded need not be delayed by circumstances which delay the wheeled transport or compel it to remain at the rear.

The addition of a water-cart to the equipment provides not only for drinking water at the front but makes it possible to establish a dressing station in an advantageous and sheltered position irrespective of proximity to streams or ponds which are usually so stirred up and muddy from the passage of troops as to be most undesirable for drinking or other purposes.

TRANSPORTATION.

Ambulances,	no. 15	Mounts for H. C., one for each
Ambulance supply wagon,	no. 1	noncommissioned officer and
Harness, ambulance and wagon,		medical officers' orderly.
double sets,	no. 38	Mules, for packs and water-cart, no. 3
Harness, cart, single set,	no. 1	Pack saddles, complete, no. 2
Horse equipment, for mounted		Wagons, four mule, for forage,
Hospital Corps,	no. 27	personal equipment and sup-
		plies, no. 4
		Water-cart, no. 5

ANIMALS WITH AMBULANCE COMPANY.

60 Ambulance mules.	6	Officers' horses.
16 Wagon mules.	22	Noncommissioned officers' horses.
2 Pack mules.	5	Medical officers' orderlies' horses.
1 Water-cart mule.	112	

EQUIPMENT FOR DRESSING STATION.

(Carried in ambulance supply wagon).

Axes,	no. 10	Chest, surgical, regimental,	no. 1
Basins, agate, 3 in nest,	nest. 1	Filter, Maignen,	no. 1
Buckets, agate, 3 in nest,	nest. 1	Kettles, camp, nest of 2,	nest. 1
Case, bedding, containing 12		Maul,	no. 1
woolen blankets, and 6 rub-		Pans, mess, nest of 2,	nest. 1
ber blankets,	no. 1	Portfolio, water-proof cover,	no. 1
Case, emergency, (carried by		Registers, pocket, field,	no. 6

non commissioned officers),	no. 3	Surgical dressings, box of,	no. 1
Chest, commode.	no. 1	Tables, folding, field operating,	no. 2
Chest, medical, regimental.	no. 1	Tent, hospital, with fly, poles.	
Chest, sterilizer, regimental.	no. 1	pins, complete,	no. 1

AMBULANCE STATION EQUIPMENT.

When carried on two pack mules.

Axes,	no. 2	Kettles, camp, nest of 2,	nest 1
Basins, agate, 3 in nest,	nest 1	Maul,	no. 1
Buckets, agate, 3 in nest,	nest 1	Pans, mess, nest of 2,	nest 1
Case, bedding, containing 12 woolen blankets, and 6 rub- ber blankets.		Portfolio, water-proof cover,	no. 1
Chest, detached service,	no. 1	Registers, pocket, field,	no. 1
Ambulance box of hospital stores,	no. 1	Surgical dressings, box of,	no. 1
Ambulance box of surgical dressings,	no. 1	Tables, folding, field, operat- ing.	no. 2
		Tent, hospital, with fly, poles,	
		pins, complete,	no. 1

Total weight, about 425 lbs.

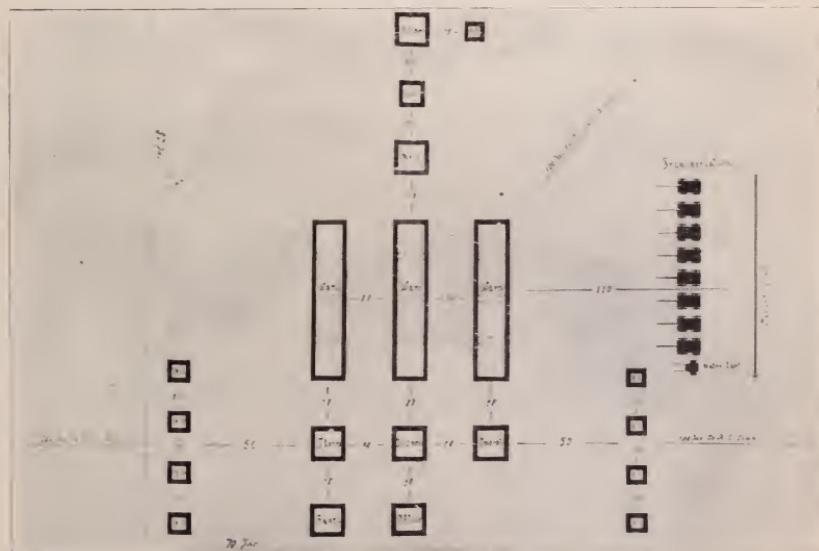


Fig. 5. Plan for Pitching a Brigade Field Hospital.

THE FIELD HOSPITAL OF THE BRIGADE is an independent unit and provides hospital treatment for the sick and wounded on



Fig. 6. Brigade Hospital pitched in accordance with Fig. 5.

the march and in camp. The regimental hospitals are considered to be sections of the field hospital with which they are consolidated whenever conditions render it advisable.

Ordinarily, field hospitals are to be pitched in accordance with an approved plan. (see Fig. 5) Many conditions may require modification of the plan, however, as lack of space, conformation of the ground, length of the stay in camp, etc.

The hospital is pitched in three (regimental) ward sections. Unless the troops are about to engage in action, a portion only of the hospital is unpacked and pitched. Fig. 5. shows a plan for pitching the field hospital.

On the march the field hospital train is in advance of the brigade wagon train, and behind the ambulance company.

ORGANIZATION AND DISTRIBUTION OF PERSONNEL OF FIELD HOSPITAL COMPANY

5 Medical officers, 1 line officer (qr. mstr.), 13 noncommissioned officers (1 First sergeant, 4 sergeants, 8 corporals) 62 privates (37-1st class, 25-2nd class privates).

MEDICAL OFFICERS.

1 In command. General supervision. Reports, records, and returns.

- 1 Executive officer. Summary Court. Command of Hospital Corps company. In charge of mess and medical supplies. Admissions and discharges. Patients' effects.
- 3 Attending surgeons. One to each (regimental) section.

NONCOMMISSIONED OFFICERS.

- 1 First sergeant. In general charge. Records.
- 1 Sergeant. Dispensary and medical supplies.
- 1 Sergeant. Transportation.
- 1 Sergeant. In charge of mess, wards and nursing.
- 1 Sergeant. Police.
- 1 Corporal. Operating tent.
- 1 Corporal. Records.
- 3 Corporals. Wardmasters.
- 3 Corporals. Supernumeraries (available for detached service, to replace sick, etc.).

PRIVATES.

- | | |
|--|---|
| 4 Cooks and asst. cooks. 2-1st class, 2-2nd class. | |
| 1 Dispensary. 1st class. | 2 Property attendants. 2nd class. |
| 2 Clerks. 1st class. | 2 Nurses. 1st class. |
| 5 Orderlies. 2nd class (mounted). | 9 Drivers. 2-1st classss, 7-2nd class. |
| 5 Police and canvasmen. 2nd class. | 1 Artificer. 1st class. |
| 1 Patients' effects. 2nd class (mounted.) | 1 Blacksmith. 1st class. |
| 5 Police and canvasmen. 2nd class. | 2 Trumpeters. 2nd class. |
| 1 Patients' effects. 2nd class. | 4 Supernumeraries. 1st class (available for detached service, etc). |
| 4 Operating room. 1st class. | |

When regimental hospitals are consolidated with the field hospital there are in addition, 3 medical officers, 6 corporals, and 39 privates. The medical officers are assigned as attending surgeons and noncommissioned officers and privates are ordinarily assigned to the same duties they performed in regimental hospitals.

EQUIPMENT FOR A FIELD HOSPITAL.

In the equipment submitted most of the articles mentioned are already on the supply table of the Medical Department. Chests, cases, etc., whose contents are given in the supply table are not described in detail. The number of cots carried (73) is sufficient for three sections of 24 beds (4 tents) each. The re-

maining beds in each section,—18 in 3 hospital tents—must be improvised, whenever the hospital is filled to its full capacity after an engagement.

It is not believed to be practicable to carry with a moving field hospital, complete bed and bedding equipment for all the men it may be called upon to shelter. In camps of instruction, in winter quarters, and under other circumstances where the hospital is to a certain extent stationary, its equipment may of course be increased to meet the requirements indicated.

	Lbs.
6 Colors, camp, on lance staff,.....	}
6 Ambulance guidons, on lance staff,.....	} 50
1 Flag, "Red Cross", with halyards,.....	}
1 Flag, Storm, National colors, with standard,	}
Calcium carbide, for acetyline generator, in 1-lb tins,.....	80
1 Acetylene generator, small,.....	100
6 Munson tents, complete, with poles and pins, each 185 lbs.....	1110
19 Hospital tents, complete, with poles and pins, (tent pins, large, 1000, small, 800) each 150 lbs,.....	2850
2 Common tents, (cook and latrine tents), each about 80 lbs.....	160
1 Field oven, large	375
1 Regimental Medical Chest,.....	129
1 Regimental Surgical Chest,.....	133
1 Regimental Sterilizer Chest,.....	120
1 Mess Chest, large,.....	325
1 Food Chest, large, about.....	200
4 Commode Chests, each 60 lbs..	240
72 Folding Cots, "Gold Medal", each 20 lbs.....	1440
2 Field Desks,.....	270
1 Maignen Filter,.....	30
3 Detached Service Chests, each 114 lbs.....	342
2 Field Operating Tables, folding, about.....	50
1 Forbes' Sterilizer,.....	109
1 Box Surgical Dressings,.....	65
12 Axe heads, 5½ lbs. each,.....	
24 Axe helvæ, 2 lbs. each,.....	} 147
6 Spades, 5 lbs. each,.....	}
3 Shovels, long handle, 6 lbs. each,.....	}
12 Cases Bedding, each 120 lbs.....	1440
6 Hatchets, 1½ lbs. each,.....	}
20 Lanterns, 2 lbs. each.....	49
12 Mauls, 5½ lbs. each.....	}
2 Pickaxes, 9 lbs. each,.....	}
4 Pickaxe helvæ, 4 lbs. each,.....	100

30 gals. illuminating oil for lanterns (1 month's allowance),	240
1 Microscope (one to each division),	14
1 Case, Microscopical accessories (one to each division), about	10
24 Buckets, G.I., 4½ lbs. each,	108
7 Cases reserve bedding, in addition to tent unit bedding, 120 lbs. ea.	840
3 Tables, mess, folding, 83 lbs. each	249
12 Chests of reserve medicines, medical and surgical dressings and supplies, hospital stores, disinfectants, antiseptics, apparatus, blanks and stationary, etc., say,	1800
20 litters,	320
1 Stove, blue flame, coal oil, small, about	25
Total weight of equipment, about	13530

Other articles to be carried but not forming part of the hospital equipment may be mentioned:

59 Hospital Corps Clothing Rolls, of men not mounted, (each 24 lbs) ..	1416
Field rations for the Hospital Corps company, 5 days at 2½ lbs. each	975
6 Officers' baggage, tentage, and mess chests, about,	1700
· Short forage rations for 63 animals at 9 lbs. each, 5 days,	2835
	6926
6 Officers' horses,	
13 Noncommissioned officers' horses,	
5 Medical officers' orderlies' horses,	
3 pack and water-cart mules,	
36 wagon mules.	

63

9 wagons: 8 for transportation; 1 for forage.

In campaign tents for the Hospital Corps should not ordinarily be carried. Part of the hospital tentage could be used by the men except when the hospital is filled with patients at which times the men's shelter tents should be used.

FIELD HOSPITAL. WAGON TRAIN, 9 FOUR-MULE WAGONS.

WAGON NO. 1. MESS EQUIPMENT, ABOUT 2200 LBS.

1 Field Range.	1 Mess Chest.	1 Food Chest.
1 Forbes' Sterilizer.	1 Hatchet.	2 Lanterns.
1 Axe head.	1 Axe helve.	1 Pickaxe head.
1 Pickaxe helve.	1 Spade.	1 Maul.
2 Buckets, G. I.	1 Maignen Filter.	1 Common tent.

975 Rations, Field, 5 days.

WAGONS NO. 2 AND 3. TENTAGE. ABOUT 4500 LBS.

6 Munsen tents, complete.	19 Hospital tents, complete.
1 Common tent, complete.	3 Wall tents, officers', complete.
	11 Mauls.

WAGON NO. 4. WARD EQUIPMENT, ABOUT 2400 lbs.

48 Folding cots.	8 Cases Bedding.
1 Field Desk.	4 Commode chests.

WAGON NO. 5. RESERVE COTS, BEDDING, ETC. ABOUT 2000 lbs.

24 Folding cots.	11 Cases Bedding.
	3 Tables, mess, folding.

WAGON NO. 6 FOR DISPENSARY, OPERATING AND SUPPLY TENTS. ABOUT 2000 lbs.

6 Colors, Camp, lance staff.	1 Acetylene generator, small.
6 Ambulance guidons, lance staff.	80 Calcium carbide, 1 lb. tins.
1 Flag, "Red Cross", with halyards.	1 Medical chest, regimental.
1 Flag, storm, National colors, with standard.	1 Surgical chest, regimental.
1 Field desk.	1 Sterilizer chest, regimental.
1 box Surgical dressings.	2 Operating tables.
1 Stove, coal oil, blue flame, small.	2 Microscopes.
20 Litters.	1 Box Microscopical accessories.
5 Hatchets.	5 Spades.
18 Lanterns.	3 Shovels, long handles.
11 Axe heads.	1 Pickaxe head.
23 Axe helvies.	3 Pickaxe helvies.
	30 gals. oil for lanterns.

22 Buckets, G. I.

WAGON NO. 7. BAGGAGE, ABOUT 2400 lbs.

5 Officers' baggage.	5 Officers' mess outfit.
	59 Clothing Rolls, Hospital Corps.

WAGON NO. 8. FORAGE. ABOUT 2800 lbs.

Forage rations, 5 days for 63 animals.

WAGON NO. 9. RESERVE MEDICAL SUPPLIES. ABOUT 2000 lbs.

Reserve supplies.	3 Detached Service Chests.
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PROVISION FOR ADVANCE FIELD HOSPITAL WORK.

"The suffering caused by exposure and a further journey to a field hospital may completely neutralize the surgical work that has been promptly and efficiently performed; this extra suffering is chiefly caused by the absence of shelter, and therefore should be preventable. For surely it will be possible to get hospital equipment so light that it will not hamper the extreme mobility that a bearer company now has, and which (an advance section of a field hospital) must have in at least equal degree." (Stapleton).

To refer again to the French field sanitary service. In a report to the Surgeon-General of the Army, Kulp states: "They treat on the battle-field if necessary and practicable such wounded as cannot be removed, thus re-inforcing the dressing stations." In "A plea for Earlier and more Permanent Treatment of the Wounded on and near the Battlefield" (Proc. Assoc. Mil. Surgeons. 1896), Col. Forwood has shown the necessity in our service of an advance section of a field hospital. It is therefore recommended that pack-mules to carry the necessary supplies be ordinarily included in the transportation of field hospitals. The equipment to be carried by them should supplement that carried by the pack-mules of the ambulance company. Litters (which may be used as cots), blankets, hospital tent flies, and filled water casks would probably meet the most urgent needs.

Besides pack-mules, one light wagon should form part of the transportation to carry supplies for the advanced section and on the march to be in advance of the wagon trains. The equipment to be carried should be the most necessary articles, which are about as follows:

EQUIPMENT FOR ADVANCE SECTION OF FIELD HOSPITAL.

3 hospital tents, poles and pins (150 lbs.),.....	450 lbs.
2 folding operating tables (each about 25 lbs.),.....	50 "
3 blanket cases, containing 36 blankets and 6 rubber blankets,..	175 "
18 folding cots,.....	360 "
2 ambulance boxes of hospital stores,.....	{ estimated.....
2 ambulance boxes of surgical dressings,.....	100 "
1 medical chest,.....	129 "
1 surgical chest,.....	133 "
1 sterilizer chest,.....	120 "
	<hr/>
	1517 "

IN ACTION.

The lines of aid in action are shown in the accompanying diagram (Fig. 7).

At the beginning of an engagement the site for the *Field Hospital* is selected and the camp is then pitched. Its location depends upon many circumstances but certain general rules are to be borne in mind. As described by Longmore and others the site of the hospital should be—"Sufficiently far from the actual

scene of conflict to be safe, in considerable degree, from risk from being brought within the sphere of fighting—either in the

Firing Line

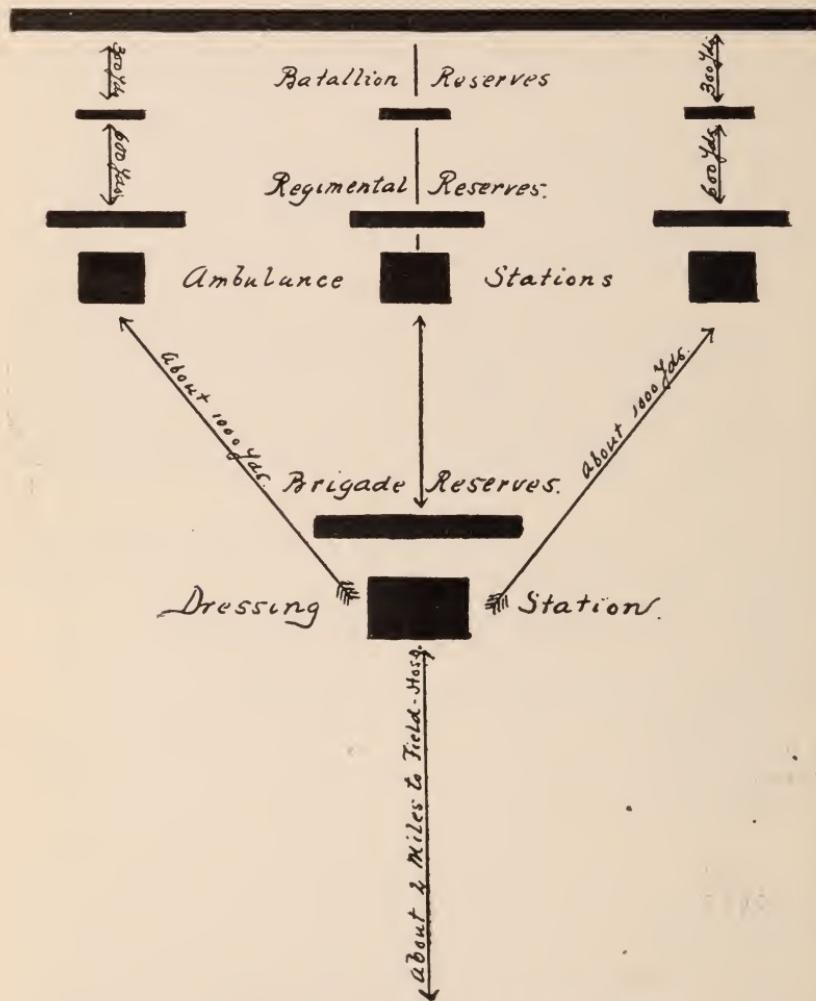


Fig. 7. Diagram showing the Lines of Aid in Action.

movements of the troops while manoeuvring or in case the (brigade) to which the hospital belongs having to retire.....

From two to three miles will probably be found to be necessary This will not be too far for communication by wheeled vehicles, and will generally be sufficiently safe as regards the wounded." The next important considerations are a good supply of wood and water and facility of communication with the front by wheeled vehicles. Strategic points or localities likely to be occupied for any military purpose, should of course be avoided as well as too close proximity to the main route followed by the troops and the baggage train.

To Dressing Station

STATION is next located and equipped. Near it the ambulance company pitches its camp.

The dressing station should be as near the front as possible; "at a spot easily reached by wheeled vehicles on the road toward the field hospital, and near an ample supply of water." It should be in a sheltered locality, out of range of infantry and aimed artillery fire. These considerations require its usual location to be at least a mile from the firing line and just behind the brigade reserves.

From the dressing station go forward the *ambulance station parties*, three in number, one to each regiment. Ambulance sta-

SECTIONS.

1. RECEIVING, AND SLIGHTLY WOUNDED.
2. DISPENSARY.
3. SEVERELY WOUNDED AND OPERATING.
4. KITCHEN.

AMBULANCE STATION PARTY.

2. MEDICAL OFFICERS.
5. N. C. O.
15. PRIVATES.
3. COOKS.
2. ORDERLIES.
10. ATTENDANTS.

EQUIPMENT.

1. CHEST, MEDICAL.
- 1 " SURGICAL.
- 1 " STERILIZING.
- 1 " COMMODE.
- 1 MAGNEN FILTER.
- 1 BOX OF SURGICAL DRESSINGS.
- 1 PORTFOLIO AND POCKET FIELD REGISTER.
- 2 FOLDING FIELD OPERATING TABLES.
- 1 BLANKET AND BEDDING CASE.
- 1 TENT, HOSPITAL, COMPLETE.
- 2 CAMP KETTLES, 2 MESS PANS.
- 2 BASINS, 3 BUCKETS, 2 AXES, 1 MAUL

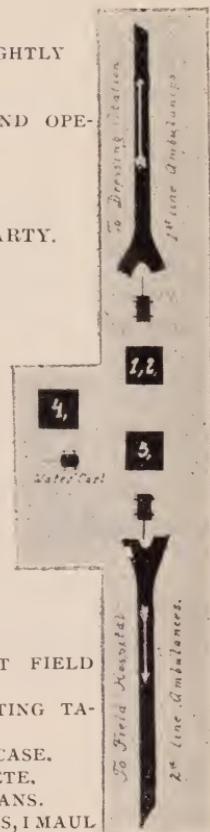


Fig. 8. Diagram of a Dressing Station.

tions are established as near as possible to the front where some protection from rifle shot may be had, at places practicable for wheeled vehicles and readily reached from the ambulance station. Conditions will usually require the locations to be at least 1000 yards from the firing line and just behind the regimental reserves. The equipment of ambulance stations consists solely of articles carried by the personnel,—litters, Hospital Corps pouches, orderly pouches, emergency cases, knives and canteens.

The regimental medical officers are distributed along the line as near the front as possible. Their duties may be described as rendering first aid to all whom they are able to reach, to prevent loss of life in particular cases such as severe hemorrhage, to prevent malingering and crowding at the ambulance stations, and to have general supervision of the bearers in advance of the ambulance stations. So long as troops continue to advance, no attempt is made to organize an ambulance station, the wounded are attended on the way and collected into sheltered spots; but as soon as the firing line is stopped, an ambulance station is established.

The ambulance company is distributed at the aid stations as shown below:

DRESSING STATION PARTIES.

5 Medical Officers.	1 Quartermaster.
5 Non-commissioned Officers.	15 Privates.
1 First sergeant. In general charge.	3 Cooks.
1 Dispensary and slightly wounded section.	2 Orderlies.
1 Records.	10 Attendants.
1 Mess.	1 Operating room.

With ambulances, 2 non-commissioned officers, 17 privates.

AMBULANCE STATION PARTY.

Each:-

1 Medical Officer.	4 non-commissioned officers.	17 privates.
1 bearer sergeant in charge.	3 bearer corporals.	
16 litter bearers.	1 medical officer's orderly.	
1 Q.M. sergeant.		
3 wagon drivers.		
1 blacksmith.		
1 saddler.		
1 packer.		
1 cook.		

With wagons, animals, and reserve supplies.

The work of the ambulance station consists in collecting the wounded and preparing them for transportation by ambulance to the dressing station. Only urgent cases receive surgical attention, the object of the stations being to collect and send the wounded to the rear with the least practicable delay.

The dressing station is the aid station nearest the front where the needs of the wounded receive careful attention. The wounded are here classified, examined, and dressed. Necessary operations are performed, and the patients are fed and prepared

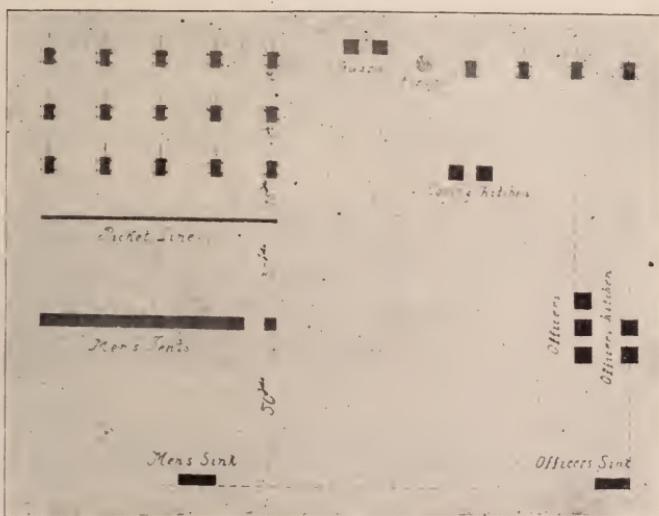


Fig. 9. Camp of an Ambulance Company.

for the journey to the field hospital to which they are carried by the ambulances of the second line. Critical cases unable to endure further transportation are retained to be cared for later by a section of the field hospital. Wounded are evacuated as rapidly as possible to enable the ambulance company to be in readiness to follow the brigade.

The organization and equipment of the dressing station and the camp of the ambulance company are shown in the diagrams. (Figs. 8 and 9.)

THE DUTIES OF MEDICAL OFFICERS IN THE FIELD.

It might be stated in concluding this subject, that while organization is essential to success in all that we are expected to accomplish in caring for the sick and wounded in time of war, the administration is equally essential as on it depends the execution of the work, for the performance of which the organization was perfected. A medical department may be carefully and thoroughly organized and yet be certain to fail, if it has not in the administrative positions men fitted for their duties by training and study and familiar with all the details of the organization of which they form a part. The example of a large business corporation may be referred to as an illustration of this point. Its success depends not only on the way it is organized but equally as much on the fitness of each official for the duties intrusted to him.

Familiarity with the duties of medical officers in the field can only be obtained by experience, and in part by education. The medical officer on his entry into the service has had no opportunity to acquire a knowledge of these duties, and before the establishment of the Army Medical School there was no opportunity for him to learn what these duties were or know what was expected of him at his first post of duty. The value to the Army of this school has been increasingly manifested as its work has developed and its classes gone forth. The course of instruction, while perhaps not long enough to teach in a practical way the duties of medical officers in the field, has given them an understanding of what these duties are, which will enable them to extend and perfect that knowledge as their service and experience increases.

The War Department has recently located camps of instruction where large organizations of troops can be assembled under active service conditions. The opportunity for the Medical Department to take part in these maneuvers will enable it to learn its duties in the field in the most practical way which is afforded in time of peace.

[NOTE.—The essay was concluded with a description of the articles of field equipment which are mentioned in the text. A list of the separate headings is here given.]

DESCRIPTION OF ARTICLES OF FIELD EQUIPMENT.

Contents of Portfolio.

Contents of Ambulance Box of Surgical Dressings.

Contents of Ambulance Box of Hospital Stores.

Spare parts and additional articles carried by each ambulance.

Spare parts and additional articles carried by each wagon.

Extra Articles carried in Wagon No. 1.

Parts of Four-Mule Wagon or Ambulance Harness.

Parts of Pack Saddle.

Horse Equipment for mounted members of the Hospital Corps.

Blacksmith's Tools.

Saddler's Tools.

Contents of Unit Canvas Bedding Case.

Reserve of Bedding and Clothing.

Contents of Box of Surgical Dressings.

Contents of Acetylene Illuminating Outfit Chest.

Contents of Mess Chests, large and small.

Medicines.

Miscellaneous.

Surgical Instruments, Appliances, and Dressings.

Stationary.

Record Books, Medical Department.

Blanks: Medical, Adjutant General's, Inspector General's, Subsistence,

Quartermaster's, Ordnance, and Pay Departments.

Contents of Accessory Field Case for Microscopical Work.

Medico-Military Index.

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Editorial Department.

POINTS OF SPECIAL INTEREST IN THE REPORT OF THE SURGEON GENERAL OF THE ARMY FOR 1901—1902.

THE Report of the Surgeon General of the Army for the fiscal year ending June 30, 1902, appears oddly thin in comparison with its more bulky predecessors of the last few years,—a condition due to the exclusion of the professional reports of army medical officers, which have formed so valuable and important a feature of recent reports. When the publication of professional papers in the annual report of the Surgeon General was inaugurated in 1887, it was thought by the distinguished officer, then serving as the Surgeon General's Executive Officer, that the plan would obviate the necessity for a military medical journal, the publication of which he discouraged. Subsequent events have indicated the error of his position, which is now fully confirmed by the attitude of the President and the Secretary of War in opposing the inclusion of accessory matter with the reports of Bureau Chiefs. This circumstance imposes upon the JOURNAL OF THE ASSOCIATION OF MILITARY SURGEONS the entire responsibility for the publication of American military medical literature and renders the necessity for its existence still more conspicuous. A number of important papers, prepared with a view to publication in the report of the Surgeon General, have accordingly found their way to the editor's table, and information has been received of still others which are on their way.

An important recommendation contemplates the establishment of a new general hospital in the District of Columbia, to take the place of the present small Hospital at Washington Barracks. In making this proposition the Surgeon General recognizes the desirability of having at the headquarters of the army a hospital detached from a military post where its operations would

be embarrassed by the ordinary post routine and hampered by lay control. He advises them that it be placed directly under the supervision of the Surgeon General and the Secretary of War. In addition to the numerous functions subserved by the ordinary general hospital, this institution would then be available for the treatment of cases requiring special treatment and elaborate observation for which the facilities of the ordinary post hospital are insufficient. It would also provide accommodations for the numerous cases, for which the attending surgeon in Washington is now obliged to seek admission to civilian hospitals. A second important function of such a hospital would be to facilitate the instruction of student officers in the Army Medical School, and to develop and amplify the work of a Hospital Corps Company of Instruction to be maintained in connection with it. The Royal Victoria Hospital at Netley is adduced as a precedent, and the new hospital for the English Medical Staff College at Milbank,—which is soon to replace the Netley institution,—might also be mentioned as a still more convincing demonstration of the advantage of the proposed establishment. A third advantage to be derived from an institution on the lines proposed is the opportunity for expansion in case of war. With a satisfactory nucleus such as would be afforded, amplification to any extent would be readily and rapidly possible under the stress of active service at any time. This is the logic of stern facts which can not be controverted and the materialization of the proposition will be vastly to the advantage of the service.

The JOURNAL does not contemplate taking up the report in detail. Copies of it have been so widely distributed that most of our readers are familiar with it. It is well to note, however, that the health of the army continues to show a progressive improvement, doubtless, due to the greater familiarity of the troops with the sanitary demands of tropical environment. This is forcibly shown by the fact that the death rate from all causes for 1901 is 13.94 per thousand as compared with 22.74 per thousand in 1900. In this connection, it should be remarked that in the general discussion of the subject on page 45, a typographical slip makes the rate 19.94, an error which is however corrected in the comparative Table No. I to 13.94, the proper figure.

Reviews of Books.

DISEASES OF THE STOMACH.*

A BOOK which has had the advantage of two exhaustive and scholarly revisions in the brief space of five years may be expected to be thoroughly abreast of the most advanced knowledge of the subject to which it is devoted. The first edition of this valuable work opened up a field of usefulness to the general practitioner, hitherto attended with great difficulties and marked by numerous diagnostic *culs de sac*. The scope of the book is so clearly shown in the title and sub-title that a description of the field encompassed by it is superfluous. The present edition is strengthened by emphasis laid in many places upon the factor of differential diagnosis, the chapters upon Ulcer and Carcinoma have been rendered more complete, and a new article on Gastric Lipase has been added.

GENERAL PARESIS.†

GENERAL paresis has so small a position in medical literature and so large a place in the diseases of modern life that an authoritative discussion of the subject is heartily to be welcomed. The writer has excellently succeeded in his purpose of compiling a study of the subject addressed to the general practitioner and the medical student, with a view to lay before them, as clearly as he may, the special features of a disease so

**Diseases of the Stomach*, their special Pathology, Diagnosis and Treatment, with Sections on Anatomy, Physiology, Chemical and Microscopical Examination of Stomach Contents, Diabetes, Surgery of the Stomach, etc. *Third Enlarged and Revised Edition*. By JOHN C. HEMMETER, M. D., PHILOS D.; Roy 8 vo.; pp. xxiii, 894; 56 illustrations; Philadelphia, P. Blakiston's Son & Co., 1902.

†*General Paresis*, Practical and Clinical. By ROBERT HOWLAND CHASE, M. D., 12 mo, pp. xi, 290; 37 illustrations, Philadelphia, P. Blakiston's Son & Co., 1902.

prevalent as to claim its victims from every walk and station of life. Recognizing a prodromal stage and three stages of the disease itself, he discusses each of these clearly and then takes up the varieties and particular symptomatology of the disease, illustrating the text not only with the quotation of numerous typical and atypical cases but presenting numerous halftones of actual cases from the records of the Pennsylvania State Hospital for the Insane at Norristown. The concluding chapters, on the pathology and pathological anatomy and the treatment of the affection, are admirable and effective.

ATLAS AND EPITOME OF TRAUMATIC FRACTURES
AND DISLOCATIONS.*

S AUNDERS' Series of Hand Atlases has been the means of bringing before the American medical profession a number of the most valuable contributions of the best German teachers, but none of them surpass in utility the handbook of Professor Dr. Helferich on Fractures and Dislocations. The illustrations, for which the book is specially notable and for which the text is no more than a simple setting, are remarkable specimens of surgical portraiture, most of them being in fact portraits from the actual subject. The use of colors in the full-page plates is effective and artistic. The text is succinct and clear and the English expression of the German original is idiomatic and correct. The book is small and convenient to handle and may with advantage be always within reach of the practitioner.

*SAUNDER'S MEDICAL HAND ATLASES:—Atlas and Epitome of Traumatic Fractures and Dislocations. By PROFESSOR DR. HELFERICH, Professor of Surgery at the Royal University, Greifswald, Prussia. Edited, with additions, by JOSEPH C. BLOODGOOD, M. D., Associate in Surgery, Johns Hopkins University, Baltimore. From the fifth revised and enlarged German edition. With 216 colored illustrations on 64 lithographic plates, 190 text-cuts, and 353 pages of text. Philadelphia and London: W. B. Saunders & Co., 1902.

VOLVULUS OF THE SMALL INTESTINE—ITS RELA-
TIONS TO HERNIA—TORSION OF THE ENTIRE
MESENTERY. REPORT AND RESUMÉ OF
CASES.

BY GEORGE TULLY VAUGHAN, M.D.

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UNIVERSITY; BRIGADE SURGEON U. S. VOLUNTEERS
DURING THE WAR WITH SPAIN.

SOME years ago Leichtenstern found in about 1500 cases of intestinal obstruction that only 33, or a little over 2 per cent, were caused by volvulus.

In Gibson's recent article, "A Study of 1000 Operations for Acute Intestinal Obstruction and Gangrenous Hernia," volvulus is given as the cause of obstruction in 12 per cent. of the cases, coming fourth in the list of causes, hernia holding the first place with 35 per cent, and intussusception and bands coming second and third, each occurring in about 19 per cent of cases; so volvulus is now recognized far more frequently than formerly as a cause of intestinal obstruction.

Definition. Volvulus is from the Latin word *volvere*, to roll. In surgery it means the rolling or turning of the intestine and mesentery in such a manner as to obstruct the lumen of the intestine, the circulation in the blood vessels, or both.

For a long time volvulus was used synonymously with ileus and meant almost any form of intestinal obstruction. In a thesis written in 1765, Grol states that volvulus is caused by erysipelas, inflammation, tumors, scirrhus, faecal impaction, enteroliths, worms, and intussusception.

Early in the last century Rokitansky described three forms of volvulus:

1. Rotation of the bowel on its own axis.
2. Rotation of a loop of bowel around its mesenteric axis.
3. The intertwining of two adjacent loops of bowel.

Etiology and Pathology. The mesentery is a fan-shaped double fold of peritoneum extending from the vertebral column to the convolutions of the jejunum and ileum which it envelopes, forming their peritoneal coat. The root of the mesentery is about six inches broad, extending obliquely from the left side of the second lumbar vertebra to the right sacro-iliac symphysis. Its length is about four inches from the vertebral attachment to the intestines where it spreads out like a fan to include some 19 feet of intestine. It contains between its folds the vessels and nerves of the small intestine. The shape of the mesentery, with its narrow pedicle or root and its broad periphery, would seem to make it an easy victim of rotation whenever the vermicular motion of the intestines attached to its broad end becomes unusually active, and the only surprise is that torsion of the mesentery is not more frequent. A *portion* of the mesentery may be involved, as in case of rotation of a coil of intestine 15 inches long, the portion attached to that coil would undergo torsion; or the *entire* mesentery attached to 19 feet of intestine may be twisted by rotation around its own axis, either from right to left or from left to right, making from half a turn (180 degrees) to two complete turns, as in a case reported by Delore in which almost the entire ileum was twisted twice around its mesentery from right to left. Bassinot believes that the direction of rotation is more frequently from right to left as the hands of a watch move, and this opinion seems plausible when we consider the oblique attachment of the root of the mesentery, the upper border bearing to the left and the lower border to the right, so that a weight or traction acting vertically on the upper border in line with the long axis of the body when erect, would tend to pull it down on the left side while the lower border ascends. This motion continued would cause rotation from right to left, or as the hands of a clock move. But my statistics, while not numerous enough to be of much value, do not sustain this theory, as in 14 cases of torsion of the entire mesentery in which the direction was given, only 6 were from right to

left and 8 were in the reverse direction. Taking all the cases together of torsion of the *entire* mesentery and of *parts* of the mesentery in which the direction of the turn is given we have 24 cases, in 11 of which the direction is from *right* to *left* and in 13 the reverse.

Rotation of a segment of intestine on its *longitudinal axis* is rare, but it may be caused by bands, adhesions or tumors. A tumor attached to the upper border of a horizontal portion of intestine would by gravity tend to fall below, bringing the upper border with it, rotating the tube on its axis and possibly diminishing its lumen and obstructing its vessels. It is more common for a tumor to produce rotation of the mesentery, as in a case reported by Briddon—No 4, Series II.

Volvulus may produce obstruction of the circulation, or of the lumen of the intestine—usually it does both. Torsion of the mesentery on its axis not only arrests the venous return from the intestines which in turn reacts on the capillary and arterial circulation, causing, if complete, rapid death of nearly the entire small bowel, often preceded by hemorrhage both into the lumen of the bowel and into the peritoneal cavity, but usually by pressure of one or both of its tightly stretched borders it obstructs the lumen of the gut; and while this may block both ends of the tube it almost invariably affects the lower end—usually the ileum. Sometimes the pressure is so great as to cause ulceration at the point of pressure, or division of the coats of the bowel, as was stated by Captain Smyth in Case No. 7, Series II.

The lumen of the intestine may be occluded by pressure of one segment of bowel on another without materially affecting the mesentery. Probably many cases of "colic" are caused by the latter form of volvulus and as the intestine rights itself, the symptoms disappear.

All authorities agree that volvulus occurs much more frequently in the colon than in the small intestine. Of 121 cases cited by Gibson, 73 were in the colon, 58 in the sigmoid flexure, and 15 in other parts of the colon; and only 36, less than one-third, were found in the small intestine. Leichtenstern found in 76 cases of volvulus, 45 in the sigmoid flexure, 23 in the ileum,

and 8 in the jejunum and ileum combined. In my collection no cases of volvulus of the large intestine are included.

The causes commonly given are, first. *Age*. The average age of Gibson's 121 cases was 45 years. In my list, of 54 cases, the average age was 41 years, and the greatest number in any decade was 11 between 50 and 60. If we compare the average age of the cases in which hernia was associated with volvulus with those in which there was no hernia, we are at once struck with the difference—in the former the average age being 54 years and in the latter 36 years. Volvulus may occur at any age; several have been reported in persons over 70 years, and Tissier and Mercier report a congenital case.

Second, *Sex*. It seems to be somewhat more frequent in males. Gibson gives 67 males to 40 females, while the proportion in my list is 32 males to 27 females.

Third. *Abnormally long mesentery*. A long mesentery like the elongated pedicle of a tumor, predisposes to rotation. The mesentery may be congenitally long, or its length may be increased by traction on the bowels by means of faecal accumulations which especially affect the sigmoid flexure, adhesions, tumors, hernia, or general loss of flesh. There is no doubt that volvulus of the mesentery proper may, and does, occur without elongation. With the mesentery elongated like a pedicle, a slight force may cause the intestines to revolve and twist the mesentery on its axis. This force may be violent exercise, unusual peristaltic action as a result of indigestion, or traumatism as in cases reported by Turner, Hawkins, Staveley, and Giddings.

Hernia is not infrequently associated with, and is the cause of volvulus. The volvulus may affect the intestine and the small portion of the mesentery in a hernia sac, or it may be wholly within the abdominal cavity and involve the entire mesentery while only a short coil of intestine is found in an external hernia. The volvulus may be caused by traction of a coil of intestine attached to the highest part of the mesentery, dragging it down so that it becomes the lowest part, and thus makes a half revolution (180 degrees) on its axis. Such seems to have been the condition in the following case:

Case No. 21. Volvulus with Hernia. Death in less than 24 hours.—H. W.; negro; aged 35; was taken sick Jan. 21, 1902, at night, with pain, cramps in the bowels and vomiting. He had had a right inguinal hernia several years and this had come down and he thought the trouble was caused by it, as he could not reduce it. Next morning he went to work as a laborer, but felt so weak and on account of the pain in the bowels and vomiting, he had to stop and was brought to the Emergency Hospital about 12 o'clock M. Jan. 22nd. A hernia in the right side of the scrotum was reduced by taxis without difficulty and he experienced some relief, but soon after it was noticed that his pulse had not improved—it was 100 and very weak and thready, scarcely perceptible at the wrist—and he continued to vomit. When I saw him at 4 P. M. about 20 hours after he was taken sick, he was in collapse, pulse as given, temperature subnormal (97.4) voice so weak it could scarcely be heard, little pain, but that was in the bowels. He began to vomit while I was looking at him and vomited over 1000 c. c. of chylous looking fluid, and immediately died.

Necropsy: On opening the abdomen, over 1000 c. c. of dark bloody fluid were found in the peritoneal cavity. The intestines which presented were black and leathery and offensive. The bulk of the gangrenous intestines lay on the left side. Examination showed a twist of the mesentery from *right* to *left* through an arc of 180 degrees, including the superior mesenteric artery and vein. The vein contained large thrombi and the edge of the mesentery compressed a point in the small intestines about 8 feet from the pylorus, enough to leave an indentation. The caecum and appendix were drawn tightly on the stretch toward the left side and both were gangrenous. The small intestine from the point indented by the edge of the mesentery to a point just above the caecum, a little over 13 feet, was gangrenous—black and leathery. No perforation was found. The rest of the intestine above and below was in good condition, only considerably congested. The intestine contained a quantity of bloody fluid similar to that in the peritoneal cavity. It is possible that the hernia, which was a coil of the upper ileum or jejunum, started the mesentery to rotating by traction.

Sometimes the volvulus in the abdomen is kept in twist by the fixation of the coil in the hernial sac. Such was the explanation of several cases, especially those reported by Knaggs.

Symptoms and Diagnosis. The symptoms of volvulus of the small intestine are those of acute intestinal obstruction coming on suddenly, often when the patient is seemingly in perfect

health. *Pain* of a severe colicky character, usually in the abdomen although in one case it was most severe in the back (See Case No. 7), vomiting, rapid feeble pulse, subnormal temperature, obstinate constipation—purgatives having no effect, distention of the abdomen, and great prostration. *Vomiting* is usually present, but in the histories given it was reported absent in five cases—8 per cent. Many times the vomitus becomes stercoraceous, proving that although the intestine may be obstructed below, it may yet remain pervious above. The *pulse* may be little changed for the first 6 or 8 hours; after that it becomes feeble, thready, and 100 to 160 a minute. The *temperature* is unreliable; it may be normal for a while, then somewhat elevated, 100° to 101°, but later it is often subnormal. The abdomen is usually distended and tympanitic. In the early stages before tympanites becomes general a circumscribed area of tympanites in the hypogastric region, due to distention with gas of the portion of intestine involved, is a valuable symptom. There is usually tenderness over certain parts of the abdomen and sometimes a swelling, band or ridge can be made out by palpation. Occasionally a definite mass or tumor can be felt within the abdomen.

Rectal or vaginal examination will sometimes disclose a boggy mass in the recto-vesical or recto-vaginal pouch. This point has been emphasized by Major Williams, of the Indian Medical Service (Case No. 20), and mentioned by Homans, Littlewood and others. While a bloody effusion often occurs both in the peritoneal cavity and in the intestine affected, blood is seldom vomited or passed at stool.

The *diagnosis* may be difficult as to volvulus, but it is easy to determine the existence of intestinal obstruction, and that is enough to indicate the proper line of treatment. The most unfortunate mistakes are liable to be made when an unseen volvulus is associated with a visible hernia. A patient with hernia may have symptoms of obstruction or strangulation. The hernial sac is opened and a congested coil of intestine is reduced, but if a volvulus exist in the abdomen, as it too often does, the symptoms are not removed and death relieves the patient unless the surgeon does by another operation. My case is a good example of this, in which the patient's life was saved by a stroke of good luck:

Case No. 39. Inguinal Hernia with Volvulus in the Abdomen—Resection of Intestine—Recovery.—W. G.; aged 60 years; male negro; had had a right inguinal hernia for many years and was operated on for strangulation ten years ago. July 8, 1900, at 11.30 A. M., while lifting a cake of ice, the hernia came down in spite of his truss and he was unable to reduce it. He had severe pain in the abdomen and vomiting. Patient was operated on at the Emergency Hospital, at 3 P. M.—4½ hours after the symptoms began. The tumor was about the size of an adult head—very tense and dull on percussion over the lower part. The sac, which was anatomically congenital, was opened and found to contain the cæcum, part of the ileum and a large mass of omentum which was adherent to the bottom of the sac. The small intestine was slightly congested and was reduced when to my surprise, a coil of small intestine, black and gangrenous, came into view. It was up to this moment in the abdominal cavity and not in the hernial sac. The coil was pulled down until a sound part was reached, 28 inches were resected and the ends united with a Murphy button. The mesentery was swollen and oedematous. The omentum was ligated, cut away from the sac and returned to the abdominal cavity, and Bassini's operation for the radical cure of hernia was performed—the wound being closed without drainage. The patient recovered without incident—passing the Murphy button on the 14th day—and was discharged on the 18th day after the operation. When seen more than a year later he was perfectly well.

Prognosis. In my list of 61 cases there were 51 operations with 21 recoveries—a mortality of 60 per cent. Separating the two classes we find 17 operations for twisting of the *entire* mesentery, with only 4 recoveries—a mortality of 76 per cent. Delbet's second case which died of pneumonia eleven days after the operation, is included in the fatal cases although in a sense it may be regarded as a success in showing the probability of success under more favorable circumstances. There were 34 operations for volvulus of *part* of the mesentery, with 17 recoveries—a mortality of 50 per cent. Gibson reports 36 cases of volvulus of the *small* intestine operated on with 25 deaths—a mortality of 70 per cent; and of the colon 73 cases with 34 deaths—mortality 50 per cent. The high mortality in the operations for volvulus *entire*, is due to three causes; first, the more serious nature of a condition which strangulates almost the entire small intestine, injures the sympathetic plexus, and perhaps produces a rapidly fatal toxæmia—

less than 24 hours in my case; second, *delay in operating*—of the 14 cases in which the time was given which elapsed between the onset of the symptoms and the operation, it ranged from 10 hours to 9 days, all the successful cases being operated on in less than 48 hours except Major Brown's case in which the symptoms were at first not acute; and third, the difficulty of recognizing the true condition in order to act intelligently—four operators candidly confessed their inability to do so after opening the abdomen and the patients died without relief, the true condition being at last disclosed by a necropsy.

Treatment. G. H. Hunter advises the treatment of volvulus by rotation of the body of the patient around its long axis in the opposite direction to the volvulus—ascertaining this by the lack of pain when the patient turns in the proper direction. With the symptoms of acute obstruction usually seen in volvulus there should be no hesitation in performing laparotomy at the earliest possible moment. The abdomen should be opened near the median line, as a rule through the right rectus muscle in order to be more convenient to the root of the mesentery for the purpose of making an examination; unless there is a tumor perceptible, when it is best to make the incision over the tumor. The escape of bloody fluid on opening the peritoneum is often seen. The intestines are usually distended, congested and often brown or black in color. Examination of the coats of the intestines and the mesentery shows enlarged, swollen veins. Search should be made for other causes of obstruction, such as hernia, tumors, intussusception, bands, and then the mesentery should be examined thoroughly, removing if necessary all the coils of the small intestine from the abdomen in order to do so. The difficulty of recognizing the volvulus can be better appreciated by reading the experience of Major Debré, and of Kirmisson, Delbet, and Delore. Kirmisson frankly confesses that he took the twist of the mesentery for the ligament of Treitz and did not recognize the true condition. Delbet failed to recognize the condition in his first case and was under the impression that it might be a retro-peritoneal hernia as two segments of intestines—one collapsed, the other distended—passed behind a tense fold of peritoneum. He made an

anastomosis between these two parts of the bowel and found at the necropsy that he had united the first part of the jejunum with the last coil of the ileum.

If the intestine is gangrenous it should be removed and an end to end anastomosis made, unless the extent exceed ten feet; excision of a greater length, as shown by experiment and experience, is almost inevitably fatal. Gibson stated in 1900 that there was only one record of successful resection of the small intestine for volvulus—that of 127 centimetres ($4\frac{1}{3}$ feet) by Riedel. In my list of 51 operations there were 3 resections with recovery. In one of them—Dreesman's case—2.15 metres (7 feet) were removed.

In operating on hernia with symptoms of obstruction, the surgeon should always bear in mind the possibility of the existence of volvulus in the abdomen. The condition and relations of the contents of the hernial sac—as a swollen and congested loop of bowel with insufficient constriction at the rings to account for it, or an intestine of unusual appearance which could not explain the symptoms of obstruction—should excite suspicions of this complication. In every case the surgeon should satisfy himself on this point by pulling down the coils of intestine, or if necessary, by opening the abdomen.

The contents of every case of strangulated hernia should be carefully inspected—that is, under no circumstances should a strangulated hernia be reduced by the blind method of taxis—unless there are good reasons for not operating.

Following is an abstract of 61 cases—by no means a complete list—taken from the literature. This list is divided into two classes: I, those termed "entire," 21 in number, in which the entire mesentery is twisted, affecting almost the whole of the small intestine; and II, those termed "in part," 40 in number, in which only a portion of the mesentery is involved and therefore only a small portion of intestine affected.

VOLVULUS OF THE ENTIRE MESENTERY.

Case No. 1. Volvulus of the Entire Mesentery. Death.—Rokitansky in 1837 reported a case of hernia complicated with volvulus, in a woman aged 71 years. She was admitted to the

hospital in December 1830 with symptoms of strangulated hernia. The hernia was reduced by taxis but the patient died 10 days later.

Necropsy: There was peritonitis and the mesentery folded and completely twisted on itself, forming a kind of axis $4\frac{1}{2}$ inches long and $1\frac{1}{2}$ inches thick, around which the small intestines were rolled. The small intestine descended from the duodenum to the right iliac fossa and twisted upon itself in front of the vertebral column, making two circuits around the axis formed by the mesentery. The intestine was discolored, soft, friable, and perforated about 2 inches from the ileocecal valve.

Case No. 2. (Rokitansky.) Death.—A woman of 72 years, in 1833, suffered with fever, nausea, pain and tympanitis of the stomach; fecal vomiting and death in 3 days.

Necropsy: Peritonitis. Very long mesentery, which was twisted $1\frac{1}{2}$ times around its axis, the ileum occupying the upper part of the abdomen while the jejunum occupied the left umbilical region. The species of cord formed by the mesentery (twisted) pressed the two extremities of the small intestine against the left side of the vertebral column—the ileum which from $1\frac{1}{2}$ foot from the cæcum extended downward and towards the right side while the upper part of the jejunum passed under the mesentery in an opposite direction—upward and from right to left. Intestine deeply indented as if cut by a ligature where pressed by the mesentery. Gangrene.

Case No. 3. (Rokitansky.) Death.—A woman, aged 72 years, died in 1839 after suffering from abdominal pain and faecal vomiting.

Necropsy: Stomach and intestine distended with gas and yellowish liquid. The mesentery was very much elongated and twisted on itself in such a way that the ileum was situated in the upper and the jejunum in the lower, part of the abdomen, the mass of intestines occupying the left and middle region of the abdomen.

Case No. 4. (Rokitansky.) Death.—A woman aged 71 years who had suffered 12 years with a femoral hernia, died in 1839 from internal strangulation.

Necropsy: Distended abdomen, intestine containing gas and yellowish liquid; peritonitis. Mesentery attached to ileum was very long and folded and twisted on itself, forming an axis $4\frac{1}{2}$ inches long and $1\frac{1}{2}$ inch thick, around which the small intestine was wound.

Case No. 5. Operation—Death.—In Sept. 1885, Major Mignon, of the French army, saw a man aged 28 years who had

been taken suddenly ill with vomiting and severe pain in the abdomen. These symptoms continued during the night and he was sent to Val du Grace Hospital next day with the diagnosis of peritonitis. Twenty-four hours after the symptoms began, the patient was hollow-eyed, with cold extremities, pulse 150 and feeble, temperature 39°, and the abdomen distended only in the lower half; nausea and vomiting. Frequent desire to go to stool, but without effect. Laparotomy about 36 hours after the onset of the trouble, giving exit to 1500 c.c. of yellow fluid, the intestines distended and purple. The mesentery of the small intestine was found twisted once on itself from *left to right* and from below upward, making a cord about one inch thick. This was untwisted and the patient passed 200 grams of liquid faecal matter, but died 5 hours after operation.

Case No. 6. Operation—Recovery.—Routier's case is as follows: A woman was taken suddenly, in the night of January 8, 1890, with severe pain in the region of the transverse colon. Next day, the 9th, vomiting began and became faecal. There was no passage of stool or gas from the bowels. On the 10th faecal vomiting continued, temperature was 37.6, pulse small, thready and very rapid. The abdomen was large and somewhat tympanitic. To the left and on a level with the umbilicus was a painful region about the size of the palm of the hand; pain increased by pressure and percussion, and *something other than muscular contraction* was felt in this region. Internal strangulation was diagnosed and laparotomy performed on the evening of the 10th about 34 hours after the attack began. Abdomen was opened below the navel and a quantity of turbid fluid escaped. The intestines were distended and congested, while other parts of the same intestine were collapsed and pale. Introducing the finger, all seemed free downward and to the right, but to the left a tense hard body was felt about 15 centimetres in diameter. Pulling on the distended intestine it was found to run down towards the right hypochondrium and 80 centimetres were reeled off before resistance was felt. Exposing the part to sight, the intestine seemed to enter an opening like a hernial ring. Gentle traction on the intestine drew out about a metre when the sense of resistance suddenly ceased, the ring disappeared, and the mass of intestines assumed their normal relations. The circulation seemed restored except that certain parts remained dark. The abdomen was closed and the patient recovered after having a pneumonia.

Case No. 7. Operation—Recovery.—Major W. R. Brown, Indian Medical Service, operated Dec. 21, 1892, on a Cooly, aged 50 years, who had been taken with pain in the belly on Dec. 16,

soon after eating 8 or 9 plantains. Bowels moved slightly that day but not at all during the next 5 days, in spite of purgatives. The pain continued and the abdomen increased in size and became tympanitic, pain more on the right side. (Nothing was said about vomiting). Pulse 76 but feeble. Laparotomy through left rectus below navel, afterwards extended upward. The small intestines were distended and their blood vessels much congested. No obstruction could be found, so the whole of the small intestine was taken from the abdomen and surrounded with warm cloths. The caecum was then seen to lie to the *left* of the middle line and on examining the mesentery it was found to be twisted on itself from *left* to *right*, and was much congested. The coils of small intestine were taken up in the 4 hands (operator's and assistant's) and rotated in the opposite direction. The caecum returned to its normal position on the right and immediately the noise of gas and fluid passing through the bowel was heard, and the bowels moved soon after. Wound closed with drainage tube left in. The patient made a good recovery and was discharged January 23, 1893, and was shown to a medical society Feb'y 24, 1893.

In the discussion, Capt. Smyth referred to the difficulty of recognizing the condition after the abdomen had been opened, and mentioned a case in which the abdomen had been closed without recognizing the trouble—the true condition being brought out at a necropsy. He had seen several cases on the postmortem table. He stated that the actual seat of obstruction is to be found in the ileum about 6 inches from the caecum, where the gut is so compressed that the mucous membrane is sometimes divided, as in a case he had seen.

Case No. 8—Operation—Death.—Monod operated, April 2, 1893, on a girl 15 years old, who was taken six days before with symptoms of intestinal obstruction. First, obstinate constipation, (constipation was habitual) resisting the effects of purgatives, then distention of the abdomen, tympanites being greater in the centre than the periphery, as if the small intestine was distended while the large intestine was not. There was *no vomiting*; the pulse a little rapid but good, and temperature 38. The patient complained most of severe pain in the region of the kidneys. On opening the abdomen, the intestines presented as an enormous rounded mass, stretched almost to bursting, of a black, greenish color, resembling a cyst. Fluid was found in the peritoneal cavity. The enormously distended intestines were punctured and relieved of gas. The small intestine was found twisted on the mesentery, apparently from *left* to *right* involving nearly all the

small intestine. The intestine was untwisted but retained its black, greenish color, (gangrenous), and death occurred next day.

Case No. 9—Operation—Death.—Reynier reported in 1898 the case of a female operated on by his assistant sometime before for symptoms of intestinal obstruction. A torsion of the mesentery was found and it was necessary to remove the entire mass of intestines from the abdomen before they could be untwisted. The patient died.

Case No. 10—Operation—Death.—Reynier's second case was a woman aged 50 years, operated on by him in 1896, seven days after the attack began with distention, tympanites, and vomiting. He thought at first it was a case of occlusion of the large intestine by a neoplasm. On opening the abdomen the small intestines were found distended and, searching for the cause of obstruction, a band was found in the right iliac fossa under which the entire mass of intestines was engaged. He at first thought it was a retroperitoneal hernia but on drawing on the band he recognized a twist of the mesentery, from *right to left*. It was necessary to deliver the intestines from the abdomen in order to untwist them. The veins of the intestines were gorged with black blood and the intestines were in a gangrenous condition. Death was the result.

Case No. 11—Operation—Death.—Kirmisson operated March 14, 1898, on a boy aged $7\frac{1}{2}$ years, who was taken March 2 with constipation, pain and vomiting. He got better and was taken again, March 10, with the same symptoms and next day there was faecal vomiting. There was no swelling or tympanites of the abdomen but on the 14th day he was much worse with weak rapid pulse. The abdomen was opened, the intestines found contracted, and the mesenteric veins distended and a twist of the mesentery was taken for the ligament of Treitz, the true condition not being recognized, and the abdomen was closed. Death resulted.

The necropsy showed a complete torsion of the mesentery from *left to right* about 360 degrees—easily untwisted by turning it in the opposite direction.

Case No. 12—Operation—Recovery.—F. J. Shepherd operated May 9, 1898, on a man aged 27, who had been taken suddenly ill 2 days before with severe pain just below the navel and vomiting which continued. Purgatives had no effect. On admission, pulse 140, temperature $97\frac{1}{2}^{\circ}$, abdomen somewhat distended, and tender. Scar of appendectomy done two years before, with a small hernial protrusion, was seen. Laparotomy

gave exit to a quantity of reddish serum and dark colored coils of intestine presented. Two bands were divided—evidently from the old appendicitis—and the *whole* mesentery was found twisted from *left to right*. It was untwisted, the wound closed with drainage, and the patient recovered.

Case No. 13—Operation—Death.—Delbet reported, June 15, 1898, two cases of torsion of the mesentery.

Case 1. was a woman operated on nine days after the first symptoms of intestinal constriction. She was very weak, with a greatly distended abdomen which suggested volvulus of the sigmoid flexure, but this was found collapsed; likewise the caecum. The last coil of small intestine was empty and on tracing it upward, it suddenly bent in and disappeared behind a tense peritoneal fold with a prominent border upon which the intestine curved from right to left and from above downward. On following it with the finger, the impression was given of entering a cavity which suggested a retroperitoneal hernia. On lifting up the mass of distended intestines, a coil of distended intestine was seen by the side of the last coil of collapsed intestine, both engaged behind the sharp border of the peritoneal fold—a circumstance which strongly suggested retroperitoneal hernia. There was, apparently, a sharp peritoneal fold bounding an opening in which were engaged two coils of intestine—the one distended, the other empty. Traction on the superior, distended end in order to reduce the hernia, permitted a slight lengthening but failed to change the appearance of the mass. Traction on the lower, empty coil had no effect. The finger introduced behind the band showed that it was not a ring, and the strangulation seemed due rather to a bend than a constriction. It was impossible to understand the cause which prevented reduction. The coil seemed fixed in the depths. Not understanding the condition and the state of the patient not permitting further manipulation, an anastomosis was made between the collapsed and distended coils. The patient died some hours later. The necropsy showed that the anastomosis had been made between two extreme coils of the small intestine—the first coil of the jejunum and the last coil of the ileum. It was finally ascertained to be a torsion of the entire small intestine (mesentery) a little more than a fourth of the way around as the hands of a watch move from *right to left*. Matters were easily corrected by torsion in the opposite direction.

Case No. 14. Operation. Death from pneumonia.—Delbet's second case was a man aged 69 years who was taken suddenly January 30, with violent abdominal pain, especially in the right side, then vomiting and tympanites of the abdomen. Temperature 37.4, pulse 100. Laparotomy was done in the evening about

ten hours after the attack began, making the incision below the navel. A quantity of fluid escaped, having the color of that which is seen in strangulated hernia. The small intestine was distended and dark red in color. After enlarging the incision and allowing part of the intestine to escape, the last coil of the ileum was seen collapsed, twisted, and fixed under a peritoneal fold, together with another small coil, red and strongly distended. The ileum, stretched between the cæcum and the peritoneal fold, was immovable and flat against the posterior wall of the abdomen. The other coil was movable in the middle; the end engaged with the ileum behind the peritoneal fold, could be easily moved, while its other end which passed beneath another fold of peritoneum, was fixed. Between the two ends of this distended intestine, the mesentery appeared visibly twisted. It was evidently a torsion of the entire mesentery from *right to left*. Evisceration was done at once and the enormous mass of distended intestines was wrapped in hot cloths and lifted up to stretch the mesentery, which was then untwisted by a motion from above downward and from left to right, making a turn and a quarter before the intestines assumed their normal position. The wound was closed and the patient's condition was good; pulse 90 and temperature 36.8, but broncho-pneumonia set in two days later, affected both lungs, and death occurred eleven days after the operation, from pneumonia.

Case No. 15—Operation—Death.—John Homans reports a case of complete torsion of the whole of the small intestine, in the Boston Medical and Surgical Journal, Sept. 29, 1898, page 315. He said it was the first case he had ever seen and he had heard of only one case since.

A female aged seven years was taken, March 24, with pain in the stomach, bowels did not act and pain continued next day and she vomited. On the 26th vomited again and kept her bed. There was distention, tympanites, and tenderness at the epigastrium. A band could be felt in the left inguinal region, irregular in shape and a hard mass was felt with the finger in the rectum. Diagnosis, intestinal obstruction, probably intussusception, and laparotomy in the linea alba, March 29th. Dark colored fluid escaped on opening the peritoneum, and the small intestine, of a dark purple color and distended, protruded. The entire small intestine was found twisted from *right to left* on its mesenteric root. A diverticulum (Meckel's?) was found attached. The mesentery was untwisted and the intestines aspirated, removing some gas and liquid faecal matter. They were returned with difficulty and the wound closed with drainage. Vomiting con-

tinued after the operation and death occurred at the end of 24 hours. Necropsy showed acute peritonitis and patches of gangrene on the intestine.

Case No. 16—Operation—Death.—In March, 1899, Delore operated on a man aged 58 years who had been taken four days before with gradual symptoms of intestinal obstruction, constipation and tenderness of the abdomen, but he continued at work. Then vomiting, becoming faecal, set in, and he was sent to the Hotel Dieu. On the day of the operation the pulse was 120 and temperature 38.6. On opening the abdomen, turbid fluid escaped. The small intestine was much congested and distended. There was peritonitis, the intestines were fixed and it was impossible to trace the ileum to the cæcum. It did not seem to be retro-sigmoid or retro-cæcal hernia. Some bands were found and divided but they did not relieve, and the wound was closed without finding the cause of the obstruction. The patient died next day.

The necropsy showed almost the entire ileum twisted twice around its mesentery, as the hands of a watch from *right to left*, and the parts were in a condition of gangrene.

Case No. 17. Operation. Death.—Major Debrie, of the French Army, operated January 12, 1900, on a soldier who was taken on the 10th with general colicky pains in the abdomen, great weakness and constant attempts to vomit. No stool for 48 hours. Temperature had been 38.2, pulse rapid and feeble. On the day of the operation temperature, 37.4, pulse 106; vomiting bilious but not faecal. Abdomen very much distended and tympanic. Thinking it might be appendicitis chloroform was given and the abdomen was opened in the right iliac fossa. A red turbid liquid escaped and the intestines were so distended as to be kept in with great difficulty. The appendix was normal and the patient's condition required arrest of the operation. The wound was partially closed, leaving in a gauze drain. Next day (13th) pulse 120, temperature 37.6, no passage from bowels of stool or gas, patient more quiet. 14th, patient passed some gas; nausea but no vomiting. Death on the 15th.

Necropsy. The mesentery was found twisted on its axis from *left to right*, compressing the ileum 2 inches from the cæcum at one point and completely cutting off its communication with the cæcum, and again in the upper part of the ileum, about $\frac{3}{4}$ of the ileum being cut off from the rest of the intestine. The intestine above was distended; that included in the mesenteric torsion was dark colored and gangrenous.

Case No. 18. Operation. Death.—Morestin operated, March 22, 1900, on a man aged 44 years, who had been taken ill

the day before with severe pain in the abdomen, vomiting and obstinate constipation. At the time of the operation, the temperature was normal, pulse 110, and abdomen distended and tympanitic—especially in the subumbilical region. The intestines were much distended and as nothing definite could be found, evisceration was done when a twist of the entire mesentery from *left* to *right* was seen. It was untwisted by rotating it from right to left, relieving the obstruction, as shown by the cæcum filling with gas. The wound was closed, but death occurred six hours later.

Case No. 19. Operation. Resection. Death.—Küster operated May 14, 1901 on a man aged 50 years and found rotation of almost the entire small intestine around the root of the mesentery. It was untwisted and a segment of gangrenous intestine was resected. Death resulted.

Case No. 20. Operation. Recovery.—Major C. L. Williams, of the Indian Medical Service, operated in February, 1901, on a male coolie, aged about 30 years, who had been sick just 21 hours with abdominal pain coming on suddenly in the night. A boggy mass was felt in the rectovesical space by means of the finger in the rectum. The mesentery had made one-half turn (180°) from *left* to *right* and was fairly easily untwisted. Recovery followed.

Case No. 21. See page 321.

A. VOLVULUS IN PART.

Case No. 1. Operation—Recovery—Return of Symptoms—Second Operation—Recovery.—A man aged 31 years was operated on at Basle, May 6, 1887, for symptoms of acute intestinal obstruction which came on two days before. On admission, patient was collapsed, cyanotic, pupils dilated, pulse small, abdomen slightly distended, and between ensiform cartilage and navel a tender swelling could be felt.

Laparotomy over this swelling showed a volvulus of the small intestine, one-half turn (180°) of the mesentery. It was untwisted and two abrasions were seen at the point of torsion.

The patient recovered but returned in less than a year on account of constipation, pain in the abdomen and vomiting, and a second laparotomy was done in the scar of the old one. The great omentum was adherent to the wound of the abdominal wall and a fold of the mesentery was found attached by a band to the abdominal wall producing some kinking. The adhesions were dissected loose, the abdomen closed and the patient recovered.

Sublimate solution, 1-5000 was used in the first operation to disinfect the peritoneal cavity.

Case No. 2. Operation. Death.—J. C. Warren operated August 8, 1887, on a man aged 52 years who had suffered at

times from colic, for 3 or 4 years. About 3 weeks before operation he was taken with pain in the epigastrium and back; bowels first regular, then loose; *no vomiting* at any time. August 8th., he became worse with rapid pulse and great pain about the navel. There was general distention but a deep seated *resistant tumor* as large as an infant's head could be felt near the navel. Median incision over this tumor showed it to be a twisted coil of small intestine about 9 or 10 inches long about the beginning of the ileum. Considerable bloody fluid escaped from the abdomen. The volvulus was untwisted with some difficulty and the wound closed. Death next day.

Necropsy: Incipient peritonitis; mesentery greatly thickened, and veins thrombosed, but bowel in good condition.

Case No. 3. Appendix Involved in the Torsion—Operation—Recovery.—J. Nicolaysen of Christiania, operated September 30, 1899, on a man aged 27 years who was taken sick on the 25th, (5 days before) with severe pain in the lower part of the abdomen. The pain left after a short time and came on again on the 29th, with great severity below and to the left of the umbilicus. There was vomiting and the abdomen was tensely contracted and tender, especially in the right iliac region in which a *tumor-like resistance* was felt. Pulse 50–60; respiration 30. On opening the abdomen below the navel, *bloody fluid* escaped and a distended, discolored coil of small intestine appeared, twisted from *left to right* about 180 degrees, with the vermiform appendix drawn with it and forming a tense cord about the twisted point. By turning the coil in the opposite direction the strangulation was released and the appendix returned to its normal position. The appendix was removed and the abdomen closed. Recovery followed.

Within a year following, this patient had two attacks of pain vomiting and obstruction of the bowels, from which he recovered with the aid of medicinal treatment.

Case No. 4. Torsion of Mesentery Caused by a Tumor of the Mesentery.—Charles K. Briddon operated, October 18, 1892, on a girl 15 years of age, sick 4 days. She was taken suddenly with violent abdominal pain and vomiting which kept up 4 days. No bowel movements for 7 days. Abdomen tympanitic, moderately distended, and tender. Dulness on right side. Pulse 103; temperature 100.

Abdomen opened on right side; brownish discolored serum escaped and a "large coil of moderately dilated small intestine presented, which was of a dark purplish maroon color, and on separating this from other coils, a bright yellow tumor came into view, measuring 9 inches in circumference." This was found to

be a sessile lipoma growing in the mesentery and encroaching on the surface of the bowel for about $\frac{3}{4}$ of an inch. There was a twist of the mesentery which appeared to have been caused by axial rotation of the mass. The tumor was enucleated, and the patient recovered.

Case No. 5. Traumatic Volvulus—Operation—Recovery.—G. R. Turner, reported October 24, 1892, the case of a boy, aged 7 years, who fell some 12 feet into the mud, striking against the pole of a boat. Collapse soon followed with vomiting; then restlessness, pain and tenderness in the right iliac fossa. The vomited matter became faecal. The abdomen was opened 24 hours after the accident. A tangled mass of intestines (ileum) to the left of the middle line and when this was unraveled, two collapsed parts, a foot, and two feet in length, separated from one another by about four feet of intervening intestine, were found. The collapsed gut at either end passed abruptly into the healthy intestine. Dr. Turner regarded it as a case of volvulus caused by injury. Uninterrupted recovery followed.

Case No. 6. Traumatic Volvulus—Death.—Dr. Hawkins mentioned the case of a woman who died with symptoms of acute intestinal obstruction after a slight blow on the abdomen, and the necropsy showed a figure-of-8 twist of the gut behind the umbilicus, which unraveled itself as soon as exposed.

Case No. 7. Traumatic Volvulus—Death.—Mr. Staveley related the case of a child of 5 years on whose abdomen a slight blow had been struck, followed by symptoms of acute intestinal obstruction and death within 24 hours. Necropsy showed a volvulus situated 30 inches from the pylorus.

Case No. 8. Volvulus—Operation—Recovery. (Reported by Morris.)—Mr. Gould operated, October 8, 1894, on a woman, aged 25 years, taken on September 29, after eating lobster, with vomiting and severe pain in the abdomen; these symptoms continued. Resonance over the front and slight dulness in left flank. No passage from bowels since September 29. Temperature 96, pulse 120; faecal vomiting of a reddish yellow color. Abdomen opened below the navel. A volvulus of the small intestine was found, the coil being congested and purple. It was untwisted and the patient recovered and was discharged, October 23d.

Cases No. 9 and No. 10. Volvulus—Operation—Recovery.—R. C. Kirkpatrick operated on two cases.

(a) Operation November 19, 1894, on a woman aged 30, sick 3 days with pain and vomiting. For a week previous she had cramps. There was constipation; abdomen was tense, slightly

distended and tender to pressure. Temperature 100°. Pulse 78. Volvulus of 3 feet of small intestine was found, untwisted, and recovery followed.

(b) Man, aged 19, operated April 21, 1894. He was taken sick the same day with swelling of abdomen, pain, symptoms of collapse, no vomiting. Operated on in evening. No peritonitis. A volvulus of 8 inches of small intestine was found with a deep constriction at each end. It was untwisted and recovery followed.

Case No. 11. Volvulus Caused by Straining—Resection—Death.—C. B. Lyman operated, October 31, 1895, on a woman aged 30 years who was taken sick the day before soon after doing some heavy lifting. There was pain in the bowels, obstipation and vomiting. The abdomen was tender and a mass could be felt below and to the right of the navel. At the time of operation—about 30 hours after the attack came on—the pulse was 130, thready and irregular, the extremities cold. A median incision was made below the navel, when a mass of intestine, black in color, presented. An attempt to untwist it failed, and 27 inches were resected and the ends united by means of a Murphy button. Death occurred before morning. Necropsy showed that a coil of ileum had been twisted, the lower end of the loop being 3 inches from the cæcum.

Case No. 12. Traumatic Volvulus—Operation—Recovery—W. P. Giddings operated Feb'y 5, 1899, on a boy, aged 15 years, who had a fall 3 days before and was seized one hour later with abdominal pain, obstipation and vomiting. Day of operation, the abdomen was distended, tympanitic, and tender; pulse 108, thready; temperature 97.5. On opening the abdomen about 1000 c.c. of bloody fluid poured out; beginning peritonitis was evident. After removing one-half of the small intestine the twist in the mesentery was found and untwisted. The abdomen was closed without drainage and recovery followed.

Case No. 13. Volvulus—Operation—Recovery—J. T. J. Morrison reports, in 1897, the case of a fat woman, aged 53 years, taken 3 days before the operation with severe pain in the bowels, obstipation and vomiting which became stercoraceous.

On opening the abdomen a large quantity of offensive bloody fluid escaped and a greatly distended coil of small intestine appeared. This loop was about 16 inches long, seemed to be ileum and was twisted around its mesenteric axis from left to right. The bowel was deeply congested and ecchymosed, but it was untwisted and returned; the abdominal cavity mopped out, and the wound closed without drainage. Recovery followed.

Case No. 14. Congenital Volvulus—Perforation of the Intestine above the Obstruction.—Sigmoid Anus—Death.—L. Tissier and R. Mercier report in 1897 the case of a female infant, perfectly developed, born September 28, and 2 days later, became restless, refused to nurse and began to vomit. The abdomen became distended. Temperature 36.2. Patulous anus; but it was thought that the sigmoid was undeveloped and operation for artificial anus in left iliac region was made October 2. On opening the abdomen a mass of small intestines with a large mesenteric pedicle, came out. They were quite red, and distended with gas, but contained no meconium. The patient died October 5, the vomiting having persisted.

Necropsy: General peritonitis with intestinal contents in the peritoneal cavity. The entire large intestine was empty and about the size (less) of an adult ureter. 25 c.m. from the cæcum there was a sudden turnover of the ileum, the part below ascending in front, the portion above returning below and behind, the two portions making between them an angle of 180 degrees, from right to left.

Higher up the intestine was distended and had given way by a gangrenous slough about the size of a half franc piece. 40 c.m. above was a second torsion—probably due to traction of the distended part.

From December 1895 to December 1898, H. Littlewood operated on 7 cases of volvulus, 4 of the large intestine and 3 of the small intestine. There were 3 recoveries, 2 of the large and 1 of the small intestine. None of the cases involved the entire mesentery. Only those of the small intestine are given here.

Case No. 15. Volvulus—Operation—Recovery. (a).—Operated on June 9, 1897, was a woman aged 32, taken sick June 3, with pain in the abdomen, later with obstinate constipation, vomiting and abdominal distention. Pulse 150 and full. Ether was given and abdomen opened in the middle below the navel. Three or four ounces of foul smelling red liquid escaped. Some coils of small intestine were dark purple in color, distended and adherent to other coils. Fourteen inches of small intestine were found twisted from right to left on its mesenteric axis, making rather more than one complete turn. It was untwisted and though deeply grooved was left and placed next the incision which was closed with drainage. The patient had thrombosis of the right femoral vein and 3 days after the operation (12) a fecal fistula formed in the wound and on the 24th a foot of decomposed small intestine in the form of a slough was removed through this

opening. She recovered, except for the artificial anus, which was closed by a laparotomy and paring and uniting the edges. August 11th. Complete recovery.

Case No. 16. Volvulus—Operation—Death. (b). Operated on May 5, 1898, a man aged 53, sick since April 29th with abdominal pain, vomiting, and abdominal distention, more marked on the left side. Temperature not above normal, but pulse 130. No tumor could be felt. On opening the abdomen, blood stained fluid escaped; purplish colored, distended intestines were pulled out and a volvulus involving several feet of small gut was found, the twist being from *left to right* on its mesenteric axis, a little more than one complete turn. There was an ulcer on the mesentery at the twisted point. It was untwisted but as it remained distended it was incised and a Paul's tube was inserted. Abdomen closed with the intestine fixed in the edges of the wound. The obstruction seemed relieved but patient died 5 days later. No necropsy.

Case No. 17. Volvulus—Operation—Death. (c).—Operated on March 16, 1898, a man aged 20 years, taken suddenly ill on the 13th, 3 days before in the night, with acute pain about the umbilicus, which continued with vomiting offensive in character; bowels not opened since the 11th. Abdomen slightly distended, rigid, no tumor. A *doughy sensation in pelvis* on rectal examination. Under ether, abdomen was opened in middle line below navel; some peritonitis; intestines collapsed in the pelvis; distended above. A volvulus of 2 or 3 feet was found, the small intestine being twisted from *left to right* on its mesenteric axis one turn. It was untwisted and the intestine torn in doing so, but the rent was closed. Patient died on the 18th.

Necropsy showed small intestine enormously distended in its upper half. The lower four feet formed a partially untwisted volvulus and presented dark semi-gangrenous patches.

Case No. 18. Volvulus—Operation—Recovery.—Dr. John Rogers (reported by Dr. Elliot, Jr.) operated July 12, 1897, on a man aged 30 years; sailor; sick 3 days with severe abdominal pain, vomiting and great prostration. Temperature slightly elevated, pulse 120 and feeble. Abdomen swollen and tympanitic; especially in left iliac fossa. Incision in median line opposite or through navel gave exit to bloody serum; small intestine congested. Volvulus found in lower part of ileum, which was easily corrected. Vitality of gut unimpaired. Wound closed without drainage and recovery followed. Bloody stools followed during the next 48 hours especially, and somewhat for 2 weeks.

Case No. 19. Volvulus—Operation—Death.—Dr. A. B. Johnson, in 1898, saw a case of volvulus in a child 6 years old, male, sick 3 days with pain, abdominal distention, vomiting and rapid pulse. The abdomen opened in the middle, revealed a volvulus involving about 1 foot of the intestine, about six feet from the cæcum. The part included in the twist was gangrenous and was resected and anastomosis made. Death next day. It was found that gangrene extended some distance beyond the section.

Case 20. Chronic Volvulus—Resection—Recovery.—Hadra reports in 1899 the case of a woman aged 26, who had suffered very much for 4 or 5 years with the left side of the abdomen, painful at all times, but worse on stooping or bending; a feeling of nausea frequently, bowels more or less regular, tenderness on pressure over the left rectus muscle, and a feeling of resistance opposite the umbilicus and a slight swelling was felt.

Laparotomy over this point disclosed a loop of small intestine double the calibre of the parts above and below and with much thickened walls. At either end was a distinct line of demarcation or circular impression. This coil was quite congested. It was evidently a volvulus and was resected and a Murphy button put in. The button passed by the 12th day, the patient recovered and was free from all her trouble.

Case No. 21. Volvulus—Operation—Death.—Dr. Brown, saw in 1899 a colored woman, aged 60, who had suffered 7 days from acute intestinal obstruction. On admission, the abdomen was enormously distended and there was faecal vomiting. Suspicion that obstruction was caused by uterine fibroids led to opening the colon in right lumbar region; without relief, so another opening in front above the navel disclosed bloody serum and flakes of lymph and a volvulus of the small intestine. It was untwisted and was followed by a gush of faecal matter from the colostomy wound. Death in 18 hours.

Cases No. 22 and 23. Operation on both—Both Fatal.—Elosu reports two cases of torsion of part of the mesentery occurring in the service of Lannelongue in March and August, 1900. In one the mesentery had made 3 revolutions on its axis. Both were operated, 90 centimetres of intestine being resected in one. Death in both cases.

B. VOLVULUS IN PART—ASSOCIATED WITH HERNIA.

Case No. 24. Femoral Hernia with Volvulus in the Abdomen—Operation—Death.—Dupuytren operated in 1819, on a woman, aged 74, with left femoral hernia larger than two fists, which had been strangulated 12 days. Taxis had failed. After opening the sac, he was still unable to reduce the intestine.

Symptoms persisted for two days; the intestine became gangrenous and was incised. There was no relief and the patient died.

Necropsy revealed adhesions between the coils forming the hernia and a figure-of-8 crossing, in the bowel just before it passed under the femoral arch, the descending passing beneath the ascending portion.

Cases No. 25 and No. 26. Inguinal Hernia with Volvulus in the Sac—Death.—Zuckerkandl reports in 1887 two cases of scrotal hernia, one right, the other left, in men aged respectively 50 and 64 years, complicated by torsion of the mesentery in the hernial sac. One was operated on, and both died.

Case No. 27. Femoral Hernia with Volvulus in the Abdomen—Death.—L'Honneur reports, in 1856, a case of femoral hernia in a woman. The hernia was reduced, but the woman died in half an hour.

The necropsy revealed a loop of intestine 3 or 4 feet long, commencing 3 feet from the duodenum, twisted upon itself.

Case No. 28. Inguinal Hernia with Volvulus in the Sac—Operation—Death.—Dr. Cabot in 1857-58, reported the case of an elderly man who had a reducible inguinal hernia for which he wore a truss. It came down during the night and he was unable to reduce it and there was pain in the abdomen. Nine or ten hours later, he was almost pulseless and the tumor was about the size of a foetal head, tense, oedematous, blue and cold. Operation revealed a large amount of intestine twisted entirely round upon itself and in a state of complete strangulation. Death occurred before next morning.

Case No. 29.—Femoral Hernia with Volvulus in the Abdomen—Death.—Laugier operated on a case, reported in 1860, of a woman aged 49 years, who had suffered six days from a strangulated femoral hernia, and found gangrenous bowel which was opened, but the patient was not relieved and died eight days after the operation.

Necropsy showed general peritonitis and a volvulus of the lower part of the ileum from *left to right* of one complete turn.

Case No. 30. Double Inguinal Hernia with Volvulus—Operation—Death.—J. K. Fowler reported, in 1883, a case operated on by Hulke; a man aged 40, who had worn a truss for years on account of a double inguinal hernia, was taken with symptoms of intestinal obstruction. A volvulus of the small intestine was found. Death occurred 3 days later. The necropsy showed about 18 inches of ileum near the cæcum, congested and diseased. The whole mesentery was very long

—from 7 to $8\frac{1}{2}$ inches from the spine to its intestinal attachment.

Case No. 31. Inguinal Hernia with Volvulus in the Sac—Operation—Death.—C. J. Symonds reports, in 1889, the case of a man aged 72, who had had a right inguinal hernia 50 years. It became painful one day, he vomited the next, and herniotomy showed a good deal of omentum in the sac with a volvulus of the small intestine. This was reduced but the patient died unrelieved.

Necropsy—No general peritonitis, but 39 inches from the cæcum was a coil of ileum $9\frac{1}{2}$ inches long, in parts gangrenous, which had evidently formed the volvulus.

Case No. 32. Retroperitoneal Hernia with Volvulus—Death.—J. Jackson Clarke reports in 1893, a case of duodenal (retroperitoneal) hernia in a man who was taken suddenly with pain which caused him to fall in the street. At the necropsy Mr. Page found almost the entire small intestine in the hernia. About a foot of the upper part of the ileum was deeply congested—probably the result of having been twisted in the sac. The rest of the small intestine was normal in appearance.

Case No. 33. Double Inguinal Hernia with Volvulus in the Sac—Operation—Recovery.—J. T. J. Morrison operated, Oct. 1, 1894, on a man aged 38, laborer, who had had a double inguinal hernia for several years for which he wore a truss. During a fit of coughing the left side increased very much in size with agonizing pain bordering on collapse, but no vomiting. Operation five hours later. Blood stained fluid escaped on opening the sac and about a yard of small intestine which was only slightly congested. But another coil about 12 inches long and very dark in color was seen deep in the sac. This loop was twisted around its mesenteric axis and was evidently the cause of the acute symptoms and blood stained fluid. The intestine was untwisted, reduced and the radical operation for cure performed. Recovery followed.

Case No. 34. Retroperitoneal Hernia with Volvulus—Operation—Recovery.—Neumann reports, in 1897, the case of a woman, aged 55 years, who was taken 6 days before operation with sudden cramps in the abdomen, vomiting, which became stercoraceous, and obstinate constipation. Abdomen moderately distended and tender. Operation disclosed a right duodenal hernia, the sac containing the bowel lying to the *right* of the spinal column, and formed a tumor larger than a child's head. Part of the intestine was withdrawn by traction on the

lower part (ileum) when it suddenly ceased and examination showed a loop of bowel twisted into a pedicle. It was untwisted with difficulty in the sac and withdrawn. It was about half a meter long, blackish blue in color, surface dull in places, and the mesentery was œdematosus and contained infarcts. Recovery followed.

Case No. 35. Umbilical Hernia with Volvulus in Abdomen
—Death.—R. L. Knaggs operated, May 17, 1899, on a woman aged 62 with a large strangulated umbilical hernia. She was taken the day before with intense pain in the hernia and vomiting. Operation 6½ hours after the attack began. Pulse 54 and of good volume. Blood stained fluid and several feet of small intestine, distended and black with blood, were found in the sac. There was no constriction at the hernial ring. The opening was enlarged and the intestines withdrawn until healthy bowel was reached; then a volvulus involving between 4 and 6 feet of small intestine was found and released by a half turn and the intestine returned. The patient had some relief and passed feculent matter and sanguous fluid, but death occurred after 40 hours. No necropsy.

Case No. 36. Scrotal Hernia with Volvulus in Abdomen
—Operation—Death.—R. L. Knaggs operated, October 4, 1898, on a man aged 56 years, who had long suffered from a left irreducible inguinal hernia. He was taken 13 hours before with pain in the umbilical region, followed by vomiting, swelling of the hernia, and 7 or 8 hours later the passage of a quantity of bloody fluid and clots. Pulse 84.

On opening the sac, dark fluid and about 3 feet of small intestine were found—a part almost normal and the other part congested and covered with bloody fluid. The trouble was not at the abdominal rings and the finger introduced detected something like a band inside. The intestine was drawn down until it became healthy, when a constricted point was found. As the patient's condition was bad, the intestine was reduced in the hope that the volvulus would untwist and the wound was closed. Death occurred 27 hours later.

The necropsy showed the lowest 4 feet had made a single half turn from *right to left*, "so that at the neck of the volvulus the termination of the ileum lay over and directly across the ileum at a point some feet above the valve." The greater part of the loop had been in the hernial sac. Cause of death suggested as shock and faecal intoxication.

Case No. 37. Femoral Hernia with Volvulus—Resection of Gangrenous Part—Recovery.—Dreesman operated, May 7, 1898, on a woman aged 37 with a right femoral hernia. She was taken the day before with pain, swelling of the hernia which became as large as two fists, and tender, and vomiting. Pulse 160. On opening the sac dark colored fluid escaped, the intestine was gangrenous and the gangrenous portion extended into the abdomen and could not be drawn out. The abdomen was opened by extending the hernial incision, when more dark fluid escaped and a volvulus of the lower part of the ileum, from *right to left* one-half turn, was found. About 7 feet (2.15 metres) of gangrenous intestine were resected and the proximal end inserted laterally into the colon. Recovery followed.

Case No. 38. Inguinal Hernia with Volvulus in the Sac—Operation—Recovery.—J. C. DaCosta reports in 1899 the case of a man aged 49 years, with an old very large inguinal hernia which nothing would retain in place. Three days before operation there had been pain in the hernia and in the abdomen, tenderness and nausea, but no vomiting. The sac contained the cæcum, appendix, most of the ascending colon and a considerable portion of the ileum and omentum. A portion of the *ileum* was *found twisted*, adherent to surrounding structure, deeply congested and strangulated. The omentum was removed; the intestines reduced, and the patient recovered.

Case No. 39. See page 323.

Case No. 40. Femoral Hernia with Volvulus in the Abdomen—Death.—This patient seen by me was a white woman, aged 62, who had a left femoral hernia many years. It came down the night of April 24, 1902, and she was unable to reduce it. Next day she was in pain and began to vomit. When I first saw her, on the 26th, the abdomen was soft, not swollen, but was tender, as was the hernia. Pulse 120 and vomiting was stercoraceous. Patient refused operation and died about 48 hours after the first symptoms appeared. Necropsy showed slight peritonitis, but considerable effusion of dirty yellow serous fluid. The hernial sac contained about 1 inch of gangrenous ileum about 12 inches from the cæcum, tightly constricted by the femoral ring. Within the abdomen was a distended coil of intestine continuous with the portion in the hernia sac. The coil formed a volvulus about 2 feet long, by turning on its mesentery from *right to left* a half turn, and was held in place by the hernia. Reduction of the hernia permitted the volvulus to untwist.

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THE MANAGEMENT OF SMALLPOX.

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THE wide spread prevalence of smallpox makes it of importance to the military surgeon because a case of it among troops may not only endanger the lives of the officers and men, but may also cause the disarrangement of important military plans. It may be that some medical officers are not familiar with the management of the disease, and would welcome some pithy suggestions on the subject.

It is the purpose of this paper to present a sharply drawn picture of the disease as usually found, followed by directions for its care, in such shape that they can be easily remembered and utilized in time of need. There are two forms of smallpox found in the United States at this time. The difference in the types is entirely one of intensity, which modifies the symptoms and the eruption to some extent, but the disease is the same.

The following is a clinical picture that is often seen: About 14 days after infection the patient has a sharp chill, followed by a rise of temperature, 38° to 40° C. (102° to 104° F.) with severe headache, backache, and pains over the limbs and body; nausea and possibly vomiting; tongue slightly foul. On the second day there sometimes occurs an initial rash, a diffuse redness which appears on the inner surface of the thighs, sides of the chest, and lower part of the abdomen, but soon disappears. On the third day there appear small red spots, looking like flea-bites, on the forehead close to the hair line of the scalp; these are soon followed by others on the face, neck, chest, limbs and body. With the appearance of the eruption the temperature falls several degrees. The headache,

backache, and general pains lessen or disappear, and the patient feels much better. Within 24 hours after the appearance of the macules they begin to rise into papules, and at this time present the "shotty feel" so frequently mentioned by writers. This is the impression, given to the hand when passed over the skin, of a small shot beneath the skin. By the end of the third day the papules have become quite distinct, and begin to show a small whitish vesicle at the extreme top. The base has begun to broaden, and a narrow red inflammatory zone surrounds it. The papule, or vesicle as it now is, broadens rapidly, and at the same time begins to flatten, so the top instead of being conical, presents the appearance of a truncated cone. At this time the vesicle contains a clear, slightly yellow serum.

On the fourth day of the eruption, (7th of the disease) it will be noted that the vesicle, now quite flat on top, has a depression in the centre as though the point of a pin had been stuck in it. This is the commencement of umbilication. The serum that was at first clear has now become cloudy, and the vesicle has a yellowish tinge. This is the commencement of pustulation. With its appearance the temperature again begins to rise, and continues elevated.

The pustule continues to enlarge and grow more yellow and purulent. The umbilication becomes deeper and larger, as the pustule fills the inflammation around the base spreads to a larger ring; adjacent pustules encroach on each other, and finally two or more of them coalesce, forming a bulla. By the eighth day of the eruption the process of pustulation is at its height; many of the pustules have ruptured, either by thinning of its walls and increase in its contents, or by some slight traumatism, and that portion of the body is bathed in a fetid pus whose odor is very sickening.

The eruption will now be found all over the body, including the scalp, palms of hands and soles of the feet, and on the mucus membrane of the mouth, nose and throat. The eruption is usually worse on the face which is swollen until the features are unrecognizable; the eyes closed by the swelling,

and the lids are glued together with dried pus. The patient has the appearance of wearing a grotesquely hideous putrid mask; he has to breathe through his mouth as his nose is closed by the œdema of the mucus membrane. There is considerable difficulty in swallowing owing to the eruption in the throat. The eruption is most marked on the face, then on the legs and arms, then the back and chest. It is less marked in the folds of the skin, in the axilla, groin, front of elbows, and inner side of thighs.

Where ever the patient lies on the pustules, many of them rupture, bathing the parts in pus, soiling the clothing and drying causes the clothing to stick to the skin. As the skin burns and itches, and is so sore that it can not be touched without causing the patient pain, he tosses from side to side seeking rest that he does not find.

Add to this condition numerous patches of dried, yellow and blood stained pus over the entire body, face, and limbs, and surround the whole by an atmosphere reeking with sickening, fetid odors, and you have a picture of typical variola vera.

About this time the stage of delirium frequently makes its appearance, in which the patient vainly tries to escape from his tortures. He tears with his finger-nails the itching, burning skin, that clings to him like a veritable shirt of Nessus. He strives to get out of bed to flee from his troubles, and must be carefully restrained. This condition lasts about two days, by which time the active inflammatory symptoms subside, and the period of dessication commences. The pustules either are ruptured, or begin to dry up without being ruptured; scabs begin to form. The temperature gradually falls to normal or nearly so, and convalescence begins. About the 14th day the scabs begin to fall, and the process is usually completed within 10 to 20 days more.

This is the disease that until vaccination was introduced by Jenner, devastated Europe, and sent a shudder of horror to every hearer whenever the name of smallpox was mentioned.

This is the type that was familiar to the military surgeons of our civil war, and gave so much trouble to the military authorities.

Now let me give a clinical picture of the mild type of smallpox that has prevailed in this country for the past few years.

After the usual 14 days incubation, the patient has a slight headache and more or less severe pain in the small of the back. Chill absent, or slight chilly sensations; little or no fever; patient languid, and has vague "wandering pains" as though he had taken cold. In many cases however, none of these symptoms are noticed, especially in negro subjects, and their attention is first attracted by a globular eruption on various parts of the body.

If one of these cases is kept under observation from the beginning, it will be noted that the macular eruption makes its appearance in the usual manner on the third day of the disease, but often escapes notice until it becomes papular. While the eruption often commences on the forehead it does not always do so, and is quite as frequently found first on the cheeks, and especially near the angle of the mouth.

The eruption follows the usual course of macule, papule, vesicle and pustule, in the ordinary way, with the exception that the symptoms are all mild, and in a certain number of cases umbilication does not take place in the pustules. Upon close inspection several will be found in which the umbilication is distinctly marked, but a majority of the pustules are either conical with the top rounded off, giving the eruption a globular appearance when viewed from above, or the centre is occupied by a rounded plug in place of the umbilication. This latter condition is usually seen when the pustules begin to dry.

In many cases of the milder type the pustules never rupture. The skin over them is quite thick, and there is little or no inflammation surrounding the pustule. On opening one of them its contents are found to be sero-purulent, showing that the inflammatory process has been mild. In this type of

cases the active process ceases in from 6 to 8 days, and the pustule begins to dry up. The process of desquamation varies with different cases, but is usually complete in from 14 to 30 days from the commencement of the eruption. In tuberculous subjects the eruption becomes nodular, and persists longer than in other subjects. In the greater number of these cases of smallpox the eruption is discrete; in others the eruption will be confluent on the face and discrete on the rest of the body. Occasionally there will be found a confluent eruption involving the entire body. These cases usually die.

The mild form of this type of smallpox, the globular appearance of the eruption, its irregular course and low death rate, has led to much confusion in the diagnosis among those who were unfamiliar with smallpox. The disease has been most frequently mistaken for chickenpox. A little reflection should however clear up any doubts on the subject. Chickenpox is rarely, if ever, epidemic among adults; it is essentially a disease of childhood, while smallpox attacks both adults and children indiscriminately. In chickenpox macules, vesicles, and possibly pustules, may all be found in the same subject at the same time, and within 18 hours after the appearance of the eruption. In smallpox no such conditions ever arise. In chickenpox the eruption comes out in crops; in smallpox the eruption runs a steady course from the beginning to the end. The eruption of smallpox rises like a cone, the base being always broader than the top, which may be pointed, rounded or flat. The eruptions of chickenpox and impetigo rise abruptly from the skin, are more uniformly circular in outline and globular in appearance. These eruptions have been likened to the half of a lentil or French pea laid on top of the skin, while that of smallpox, the same pea under the skin.

Upon the following page will be found a comparative table showing the characters and symptoms of smallpox, and the diseases that might be mistaken for it.

TREATMENT OF SMALLPOX.

There is no specific known for smallpox when once it has attacked the patient. Repeated vaccinations with

SARCOPLASMA					
Incubation.	14 days.	12 to 14 days.	7 to 14 days.	Usually 14 days.	Not known.
<i>Invasion.</i>	Chill or chilly sensations. Headache and backache usually severe. Vomiting. Temperature 102° to 104°F.	Mild, may be slight, headache. Child is fretful and a little feverish. Vomiting. Temperature 102° to 104°F.	Begins with a coryza, and chilly sensation. Soon fever appears and may be intense. Eyes are suffused, injected and dis- tinctive. Sneezing, sore throat, husky voice,	Rigors or distinct chill, headache, pain in back and limbs, followed quickly by intense heat, with others abrupt, sharp chill, coma and death pulse 120-130. Temperature 103° to 105°F. Nausea and vomiting.	Vomiting. In some assitude, dull headache, the vomiting. In others abrupt, sharp chill, coma and death in others chill severer, occipital headache, backache and pain in upper part of spine. Stiff neck, opisthotonus, temp. low, pupils unequal in size, strabismus, nervous and muscular disturbance.
<i>Initial rash.</i>				None.	None.
<i>Eruption.</i>					None.
<i>Vomiting.</i>					None.
<i>Incubation.</i>	Present in 13% of cases	Rare.	Variable in about 24 hours and up to 4 days, last on face, neck and body or check. From 25 to 24 hours becomes palpable then vesicular, and finally pustular. Immobilization occurs about 4 to day of the disease. Appears first on forehead or cheeks. In 24 hours becomes palpable then vesicular, and finally pustular. Immobilization occurs about 4 to day of the disease. Appears first on forehead or cheeks. In 24 hours becomes palpable then vesicular, and finally pustular. Desquamation commences on 9th day. Desquamation on the 14th day of eruption and is completed in from 10 to 20 days more.	Appears in about 24 hours and up to 4 days, last on face, neck and body or check. From 25 to 24 hours becomes palpable then vesicular, and finally pustular. Immobilization occurs about 4 to day of the disease. Appears first on forehead or cheeks. In 24 hours becomes palpable then vesicular, and finally pustular. Desquamation commences on 9th day. Desquamation on the 14th day of eruption and is completed in from 10 to 20 days more.	Variable in about 24 hours and up to 4 days, last on skin, which soon fades. If eruption is not disturbed consequences to dry up, change to straw yellow granular crusts which appear "stuck on." Eruption superficial, seldom leaves pits. Is auto-inoculable even upon skin usually on face, chin, hands or exposed parts of body. Rarely general. Duration several weeks. More frequent in warm weather.

a pure, ripe, glycerinized lymph is the best preventive. Vaccination should be repeated at frequent intervals, as it has been found by experience that the protection afforded by one vaccination grows less and less as time goes on. This time varies in different individuals, and it is impossible to say how long even a perfect vaccination will afford protection in that individual. To be on the safe side it is well to revaccinate patients whenever smallpox is prevailing in that locality. If the person is immune the vaccination will not take; if it does take it shows that the person was not immune, and needed it.

There is no set method of treating smallpox; the indications are to treat symptoms as they arise. Many of the milder cases require little or no treatment. The headache and pain in the back and limbs is usually relieved by some of the coal tar derivatives. The nose and throat cause the patient much annoyance. They should be frequently sprayed with some soothing, disinfectant wash. The bowels should be kept open, especially in the earlier stages of the disease, and the patient given such light, nourishing diet as he can take. Solid food is usually out of the question, therefore the diet must consist of soups, meat extracts, milk, etc. I usually give milk, seltzer water, raw eggs, and orange juice. The latter is a favorite diet of mine. It was first suggested by Osler, I believe, as a diet in typhoid fever in place of milk; I tried it in that disease, and was so pleased that I frequently use it in other diseases to the exclusion of other food. I have kept a patient on orange juice alone for over thirty days, and it sustained him as well as milk, or any of the other diets usually given. The patients do not tire of it as they do of milk, soups, etc. As smallpox advances, and septic fever appears, the waning strength of the patient must be stimulated and conserved as much as possible. When it is remembered that that important organ, the skin, is the seat of a suppurative inflammation which in many instances involves the greater portion of its surface, stopping its excretory action and evolving septic materials, it will be understood that it is necessary to do all in your power to hold up the strength of the patient, and to

keep all of his excretory organs in the best condition possible under the circumstances. He should not be permitted to sit up or get out of bed. Many cases have died suddenly from some slight exertion, and I have noticed that death has occurred most frequently on the 14th day. The restlessness should be controlled by opiates if necessary. However but little medication is necessary; the greatest relief and best results will come from local treatment.

The local treatment consists in keeping the skin as clean as possible, and allaying the inflammation with its consequent burning and itching, which in many cases is intolerable. Frequent sponging with water softens the crusts, and keeps down the inflammation, as well as relieving to some extent the burning and itching. Spraying with peroxide of hydrogen has been used, and good results reported. I have never used this myself but am impressed with the idea and will give it a trial at the first opportunity. Anointing the body frequently with lanoline, vaseline, olive oil, etc., serves to exclude the air, and soften the parts. The bed should be protected by a rubber sheet, and the patient wrapped in a sheet soaked in oil.

I know of no treatment that will absolutely prevent pitting. The pitting seems to depend upon the violence of the inflammatory action in the pustule, and this seems to depend on the virulence or the amount of the infection. Opening the vesicles before the stage of pustulation occurs, and frequent bathing with water to subdue the inflammation and keeping the parts clean has a tendency to prevent pitting. A wet cloth should be kept over the face. Ethyl-Chloride or similar refrigerants might be tried to relieve the itching and reduce the inflammation, at least on the face, if not elsewhere.

When desquamation commences it may be aided by warm baths in the morning and evening, followed by the inunction of some oily substance. Some of the numerous disinfectant soaps might be used with advantage. The patient should not be released until desquamation has ceased, and the skin entirely smooth. Crops of acne frequently follow an attack of smallpox. Frequent bathing, followed by sponging the body with bichloride of mercury solution (1—1000) usually brings

prompt relief. Especial care should be taken to clean and disinfect the hair of the head and body before releasing the patient from quarantine.

THE MANAGEMENT OF SMALLPOX.

1. Upon the discovery of a case of smallpox, the first duty is to isolate it to prevent spreading the infection. It is well to screen the case with mosquito netting to prevent flies and mosquitoes from gaining access to it.

2. All persons who have been exposed to the infection should be vaccinated with ripe, pure, glycerinized lymph; their hair and clothing disinfected, and they should be kept under observation for full 14 days.

3. The quarters occupied by the patient, with all articles in it should be disinfected by one of the methods given below.

4. Excreta; and all articles soiled by discharges from the patient are best burned.

5. The entire command from which the patient came should be revaccinated, and carefully inspected for 14 days, counting from the time when the last exposure was possible. If the origin of the infection can be traced, it will aid largely in deciding what protective measures are necessary.

DISINFECTION.

Such articles as can not be disinfected by the following methods are best burned.

1. Boiling in water for at least one hour.
2. Superheated steam under pressure in a steam chamber.
3. Dipping in a solution of bichloride of mercury. (1-1000.)
4. Exposure to sulphur dioxide gas for 24 hours.
5. Exposure to formaldehyde gas (4% by volume) for 6 hours, or more.

1. Of the above, I prefer boiling in water for an hour for all articles that will not be injured by boiling. If the water is boiling, it is not necessary that the articles remain for an hour, but I say an hour, for if the articles are kept on the fire for that length of time, I can feel reasonably certain that they will be boiled sufficiently long. They should then be rinsed in clean water, thoroughly washed with soap, again rinsed, and hung in the sun to dry.

2. The use of steam for disinfecting requires the use of special apparatus for the purpose, and is therefore not always available.

3. Saturating the articles in the mercury solution is quite effective, and this method has the advantage of being usually available. The articles should be dried in the sun.

4. Of the gaseous disinfectants I prefer sulphur dioxide where it can be used. Its action seems more certain, and it is more easy to calculate the percentage used. Five pounds of sulphur to each 1000 cubic feet of air space should be burned, and the exposure continued for 24 hours. Sulphur dioxide has the drawback that it destroys many kind of fabrics, will turn lead paint dark, and tarnishes metal objects. It has the advantage of being one of the insecticides, and can be used to kill all sorts of vermin. It is largely used in the disinfection of houses where smallpox has occurred.

5. Formaldehyde as a disinfectant has the advantage of not injuring articles, and the time of exposure is less than for sulphur dioxide, being from 6 to 12 hours. Its disadvantages are that the solutions from which the formaldehyde is evolved called commercially formol, formalin, etc., contain a variable amount of formaldehyde, and unless the amount in the solution is known, it is impossible to calculate the percentage of the gas used. The practice of attempting disinfection by spraying formalin solution on sheets suspended in a room, and trusting to the gas being evolved, is unreliable. Even if the solution is thrown on the sheet in minute drops, and the temperature and condition of the atmosphere is most favorable, it can only be relied on for surface disinfection.

If formaldehyde is used it should be produced from a generator, and the exposure continued from 6 to 12 or 24 hours, according to the nature of the articles to be disinfected. 4% by volume should be used: 1 litre of a 40 per cent solution of formaldehyde will evolve about 1.425 litres (50.1 cubic feet) of the gas at 20° C. (68° F.)

Disinfection of Houses, Tents, etc.—To disinfect the dwelling that has contained a case of smallpox, there are two methods in general use. If the house can be made close

enough to retain the gas, it is most easily disinfected by sulphur dioxide or formaldehyde. If this can not be done, it will be necessary to render it as mechanically clean as possible, and then wash it down with a solution of bichloride of mercury. (1-1000). In order to use gaseous disinfection, the house must have all the openings closed, and the cracks stuffed with cotton, or have paper pasted over them. If sulphur is used, place a tub partially filled with water in the apartment to be disinfected; into this tub place an iron pot capable of holding double the amount of sulphur needed; into the pot put five pounds of sulphur for each 1000 cubic feet of air space to be disinfected. Pour over the sulphur a small amount of alcohol, or coal oil, and see that the sulphur is thoroughly ignited. Now leave the room, close the door, and stop all the cracks. Leave the room closed for 24 hours. The water in the tub prevents setting fire to the floor, and the vapor given off causes the action of the gas to be more effective.

If formaldehyde is used, the room is prepared in the same manner as for disinfection by sulphur. The next steps depend upon the apparatus used. Each form of generator is accompanied by special instructions for its use, and they should be followed carefully. If there is any doubt as to the amount of the gas that is being used, it will be well to double the percentage.

Disinfection is one of the most important steps in the suppression of smallpox, and every detail should be thoroughly carried out. It is well to write out carefully each step of a systematic method of disinfection, and then follow them out rigidly.

PUBLIC HEALTH AND MARINE HOSPITAL SERVICE WORK IN CONNECTION WITH SMALLPOX.

The military surgeon may at times be called upon to manage a smallpox epidemic among a civilian population, either because a place is under military rule, or for the protection of troops, or other reasons.

The officers of the Public Health and Marine Hospital Service do a great deal of this sort of work, ranging all the way from acting as expert diagnosticians to the management of epidemics. Upon the request of a Governor of a state, the Surgeon General of

the Public Health and Marine Hospital Service details an officer experienced in the management of smallpox, to serve on the staff of the governor as his advisor, and to coöperate with the state board of health, if such an organization exists in the state.

Having been several times detailed for this duty, it has been suggested that a brief account of my experiences in this connection might be interesting to the members of this Association, especially in showing the methods used in suppressing an epidemic of smallpox.

It would be impossible to give here even the briefest outline of the history of these different epidemics, or to indicate the conditions found in each of them. I have therefore selected for illustration, a short account of my detail to the staff of a governor of a state where there was no state board of health or county health organizations, and where I had to establish a temporary organization for the suppression of the epidemic. I have selected this instance because it is more likely to correspond with the conditions liable to be found by the military surgeon, and also because it indicates the methods used under such conditions.

After reporting to the Governor, and being assigned to duty, it first became necessary to ascertain with certainty the localities in the state where smallpox was prevailing, or had recently existed.

To do this I drew up a circular letter for the signature of the governor, addressed to the local authorities of each county and city in the state. In this letter I asked a number of questions relative to the health conditions in the county or city, leaving blank spaces for the answers. These were sent out, and the responses were prompt in a majority of instances. Those places where no sickness existed were especially prompt to reply. This enabled me to eliminate the greater part of the state, and concentrate my efforts on the remainder.

When no report was received, I became suspicious, and went in person to investigate. Within 10 days I had located every community where smallpox had appeared, and had received promises from the authorities of other parts of the state to notify me at once of any outbreak.

Having now found where the disease was, it became necessary to attack it in its lair. For this purpose I visited each locality where smallpox was prevailing. I would first call on the local authorities and learn the exact situation in the community; what methods had been used to suppress the disease there, and the reasons why they had not been successful.

I would then visit the individual cases to satisfy myself as to the correctness of the diagnosis, or act as expert diagnostician in doubtful or disputed cases. Having gained all the information possible in regard to local conditions, I would have a conference with the local authorities, and the general public was invited to be present if they so desired. Usually the attendance was large. I recall that in one place having a total population of 1500 in the town, there were about 1200 present at the meeting, showing the interest of the people in the subject.

After stating the conditions as I had found them, I would outline the measures, that in my opinion were necessary to suppress the disease. These measures would of necessity vary in details in each community, according to the conditions existing, but in general they were about as follows:

1. Isolation of all cases of smallpox, either in an isolation hospital, or in their own homes, preferably the former.
2. The prompt vaccination, and disinfection of the hair and clothing of all persons that had been exposed to infection, and their subsequent observation for fourteen days.
3. The disinfection of all infected houses and articles.
4. The vaccination of all persons that had not been successfully vaccinated within one year, using pure, ripe, glycerinized lymph.
5. A careful and repeated search for new or concealed cases of smallpox.
6. A general cleaning of premises, and improvement of the sanitary condition of the community. This included the airing of houses and the sunning of clothes, bedding, etc.

After seeing these measures inaugurated, and advising the authorities in regard to numerous practical details, I would pass on to another locality. I however had frequent re-

ports as to how matters were progressing, and at times I would have to return to help the authorities out of some trouble. When ever it was practicable, I always revisited the community to be sure that the disease had been thoroughly eradicated.

When the measures mentioned were thoroughly and systematically carried out, it was surprising how quickly smallpox would disappear from a locality. In one county the disease had been dragging on for nearly two years. Within two months after the authorities went to work in earnest on the lines indicated above, smallpox was practically eradicated from the county, and they have never had any serious trouble since. The reason of this was that the authorities had learned their lesson; they had come to understand that the way to keep smallpox from spreading was to take all the precautions when the first case made its appearance. Thus with an immune population, made so by vaccination, and the prompt isolation of every case as soon as it appeared, and the disinfection of all infected houses and articles, it was impossible for the disease to spread.

I consider that the thorough and repeated vaccination of the inhabitants the most important point in the suppression of smallpox. If the population of a place is immune to smallpox the disease can not spread among them. The isolation of the cases, and the disinfection of infected houses and articles are also of the greatest importance, and must be thoroughly carried out if success is to be attained.

However the secret of success in fighting smallpox lies in having a complete and competent system, and in carrying out all the details of it with absolute thoroughness.

The methods that I have given here in outline are those that have been used by the Marine Hospital Service for years, with uniform success. The subject is treated more in detail in publications on smallpox issued by the Marine Hospital Service, and can be had, free, on application to the Surgeon General of that service.

In conclusion let me offer you the following motto to guide you in all your smallpox work,

“Isolate, Vaccinate, Disinfect.”

THE PROPHYLAXIS OF CERTAIN DISEASES INCIDENT TO CAMPS IN TIME OF WAR.

BY HENRY D. GEDDINGS, M.D.

ASSISTANT SURGEON GENERAL, U. S. PUBLIC HEALTH AND MARINE HOSPITAL SERVICE.

IN spite of the ever increasing efficiency and perfection of military engines of destruction, both artillery and small arms, the study of the medical history of every war, great or small, long or short, decisive or the reverse, leads to the conviction that the old adage that "disease claims more victims than bullets," should be raised to the dignity of an axiom.

In the light of our present knowledge a review of medical military statistics leads too to the belief that this great mortality proceeds from that class of diseases, which we have of late years fallen into the habit of describing as "preventable," and the lesson is further borne in upon us that there is an intangible something, or rather an aggregation of circumstances in military operations which leads to a very much increased mortality from these maladies over that which obtains in civil life.

Beginning with these propositions, which I do not think it is necessary to defend in the presence of an assemblage of the character of the Association of Military Surgeons of the United States, I think it will be admitted without argument that such conditions are to be deplored; that if unchecked or uncorrected they must in time grow to be reproaches upon us as sanitarians; and that for every ill under the sun there is a remedy more or less effectual; these must plead my excuse for offering for your consideration the paper which I venture to obtrude upon you under the above title.

Under the title prophylaxis I would beg to include the

study of "the preventive or preservative treatment against disease as applied to an individual," and under the term camp would include any "group of tents, huts, barracks or shelters for the use of soldiers, usually for temporary quarters."

From a very incomplete and hasty study of the medical history of two wars, we are lead to the belief that in spite of the enormous advances in medical science made in the past quarter of a century, that the diseases encountered by our troops in the Spanish American war of 1898, were practically the same as those which devastated the armies in the great war of 1861-65. The differences are in many respects those of degree rather than of kind, and the smaller figures in the later war are due as much to the smaller number of combatants and the rapidity of the struggle, as to any other chain of circumstances.

A study of the medical history of both wars shows that the diseases which principally prevailed in the larger camps were intestinal disorders, diarrhoea and dysentery; fevers, malarial and enteric; smallpox and that other eruptive fever so common in civil life to infancy and childhood, measles.

To this curtailed list might be added in both wars if we desired to push and continue the analogy, several other ailments which may be classed under the head of preventable diseases, as diphtheria, and in both that exotic disease, fortunately not indigenous to the United States, yellow fever.

In the interests of brevity however, I would beg to confine consideration to the prophylaxis of enteric (typhoid) fever; smallpox and measles, and these having been discussed, the general principles arrived at can without difficulty be applied to other diseases, within certain limits imposed by their etiological factor, and method of spread.

TYPHOID FEVER.

An incomplete review of the statistics of the Civil war shows that among the troops of the Union Army there were 79,462 cases of typhoid fever, with 29,336 deaths, and a partial compilation of the statistics of the Spanish American war, so far as it was possible for me to review

the records, shows that there were 18,899 cases and 1,738 deaths from that disease.

It seems almost inevitable when troops, especially volunteers are concentrated for military purposes in camps of instruction or occupation, that within a short time enteric diseases, such as diarrhoea, dysentery, and typhoid fever promptly make their appearance, and begin their ravages. It seems equally impossible to aggregate any large number of men from different sections of the country, without including among them some one or more individuals, who are in the incubative state of enteric fever, and whose dejections or possibly other secretions and excretions, distribute the Eberth bacillus, and afford the starting point of disease that usually becomes epidemic before being gotten under control.

During the Spanish American war a commission of medical officers, appointed by the Surgeon General of the Army, investigated the subject of enteric fever in the military camps of the United States, and in an admirable report arrived at certain conclusions, among which were the specificity of the Eberth bacillus; the influence of the infection of the water supply in spreading the disease; the very possible instrumentality of flies in disseminating the specific organism by feeding upon typhoid dejections and subsequently contaminating food upon which they might alight; and the great danger attendant upon open and improperly policed latrines. It is to be remembered that not every case of enteric fever is either confined to bed from the inception of the disease, and that it is not impossible that an individual fully capable of furnishing infective material in his alvine discharges, may never take to bed at all, but may furnish one of those ambulatory cases, comparatively trivial to himself, but equally capable with a fatal case of furnishing the spark which is to light the train and result in a disastrous explosion.

To guard against the appearance of typhoid fever in a military command therefore it would seem obvious that the following points should be borne in mind: (1) early recognition and positive diagnosis; (2) absolute disinfection of the

discharges of all (hospital) febrile cases; (3) rigid policing and disinfection of all camp latrines; (4) guarding of water supplies from infection, not only by careful prevention of direct contamination, but by foresight in the location of latrines in relation to the sources of water supply; and (5) the employment of every possible means to prevent the multiplication of flies, and the invasion by them of kitchens and messing places. In addition to these, it would seem wise in military operations to consider every case of enteric fever as an "infectious case," and to treat them in a special hospital provided for the purpose, and not in the general wards of a military hospital.

In the consideration of these requirements, I have purposely placed early recognition and positive diagnosis in the first place, for the reason that prompt recognition of enteric fever is no longer a matter of long waiting and diagnosis by exclusion, but in a very large percentage of cases is possible in the early days of the disease, and probably before the period when the specific, causative organism makes its appearance in the intestinal discharges. It is for this Association to sit in judgment on the proposition therefore, as to the importance of making persistent experimental investigation into every febrile hospital case, by means of the Widal reaction, assisted by the Diazo reaction of Ehrlich, until the diagnosis of enteric can be either affirmed or disproved. The diagnosis being made, the enemy stands unmasked and revealed, and proper precautions can then be taken, with large probabilities in favor of success. But if the opportunity is neglected, the seed is sown, and under the conditions obtaining in military camps, an abundant harvest is apt to follow.

The proposition to apply the Widal and Ehrlich tests to every febrile hospital case, may seem to be an enormous one, but under an enlightened army medical management, the facilities are now supplied, and as there can be no good without a corresponding expenditure of effort, it would seem that there is no insuperable obstacle to so systemizing the work as to admit of rapid and precise results, and if diagnosis is fol-

lowed by isolation, it would seem that abundant good might result.

The second, third and fourth propositions are passed over without comment, the principles involved being universally admitted, and their application being matters of administration and discipline, which should not however be allowed to degenerate into unconsidered routine, for the strength of a chain is the strength of its weakest link, and lack of care in these very important details, will render nugatory in a large measure, the most conscientious effort in other particulars.

Passing to the last proposition, the prevention of the multiplication of flies, a large measure of success will attend the proper care and policing of latrines, and if the contents of the privies are properly disinfected, the flies will only be disgusting and no longer harmful, but the propagation of flies can largely be prevented by care in the disposal of the droppings of horses, which are the sites of election for the ovipositing of flies, and a most favorable nidus for their successful hatching. It would seem perfectly feasible, that as a routine camp measure, the droppings of horses might be simply and effectively cremated, and thus rendered harmless.

SMALLPOX.

The statistics of the Union Army in the Civil War show 18,962 cases of smallpox and 7,058 deaths. Statistics on the matter of smallpox for the United States Army during the Spanish-American War were not available, but it is the impression that the cases were so few in number as to be practically disregarded, which certainly shows a gratifying progress in sanitary administration.

It is needless before an organization of this character to dwell with any particular emphasis on the efficiency of vaccination as a prophylaxis against smallpox, but in the case of troops recruited from various parts of the country, especially from rural districts, it would seem to be imperative that every man enlisted should be either thoroughly vaccinated or should show protection against smallpox by recent successful vaccination or evidence of having had a previous attack of the dis-

ease. It is true that general vaccination, unless conducted with most careful aseptic and antiseptic precautions, may result in temporary disability of the individual for military duty, but at most this is a very transient affair and while causing discomfort is, by no means, dangerous to life or limb, and the benefits to be derived would appear to far counterbalance the temporary disability incurred.

In the management of smallpox there is but little to be said in comparison with the management of typhoid fever among troops. Early recognition and accuracy of diagnosis are, of course, even more imperative than in typhoid fever on account of the higher degree of contagiousness of the malady, but it goes without saying that the cases once discovered should be promptly isolated and no effort made to treat the disease in any part of a general hospital. This establishes the necessity for a special hospital for smallpox. Disinfection of all articles exposed to the infection of the disease should be promptly practiced, and it is a question whether in large camps or in the field, absolute destruction by fire of all articles exposed to the infection would not be preferable to an effort at disinfection which might be unsuccessful or prefunctory.

The baggage and equipment of the soldier in time of war is usually of such a nature and so limited in amount that its absolute destruction would be a matter of small hardship.

A point, however, to be dwelt upon in consideration of this subject now arises, and that is the necessity of ample assurance that the patient, upon recovery, is incapable of conveying infection before being returned to duty. The most careful and rigid examination must be made to insure that the process of cicatrization is completed and that there is no further danger of the detachment of small scales from the skin, which, in spite of their very minute size, may be abundantly capable of conveying infection to others exposed. While, as before said, there can be no question as to the efficiency of vaccination in general, in protecting against smallpox it is well to take no undue risks that can be guarded

against by careful observation of the suspects. Before being returned to duty, the smallpox patient after completing the process of cicatrization, should be subjected to an antiseptic bath, particular attention being paid to the cleansing of the hairy scalp.

MEASLES.

It is very singular to note in military operations the frequency with which measles, usually considered a disease of infancy and childhood, makes its appearance among adults. This has been the history of all military campaigns and operations for numbers of years, and on more than one occasion French and German armies have been seriously embarrassed by the prevalence of this disease and the rapidity with which it spread among the troops, and the fatality accompanying its prevalence. It will be remembered that in the Napoleonic wars there were numerous theories adduced to account for the prevalence of measles among troops, principal among which was that measles was due to a contagion communicated by rotting straw, which, at that time and to a lesser extent since, forms the bedding of troops when engaged in active military operations. It is needless at this time and day to say that such is not the case, for while the causative organism of measles is unknown it must be admitted that reasoning by analogy, there is a definite specific cause for each given disease.

During the Civil War there existed among the Union troops 76,318 cases of measles, accompanied by a mortality of 5,177. It is only fair to state that in a very limited number of instances was the mortality attributed to measles due to the disease directly, but was due to the sequelæ, such as bronchitis, pneumonia, meningitis, etc., with which we are familiar as complications in civil life.

It was specially noticeable during the Civil War that troops recruited from country districts were more liable to the invasion of measles than those recruited from cities and towns, and it was no uncommon thing, both through the Union and Confederate Armies, to have whole regiments of newly re-

erected troops entirely disabled by reason of the prevalence of this ordinary, eruptive disease.

Unfortunately little can be said as to the prophylaxis in measles. There is no inoculation for measles corresponding to vaccination for smallpox, and the prophylaxis must be limited in the nature of things to prompt and early recognition of the disease, accurate diagnosis and immediate isolation of the victims. Unlike typhoid fever and other diseases, measles spreads with tremendous rapidity, and the rapidity of its spread is analogous to nothing so much as to the spread of a brush fire. Too much emphasis cannot, therefore, be laid upon the necessity of early recognition of first cases, and immediate isolation of those stricken. Disinfection of all articles exposed to the infection should be practiced but the same query arises as in the case of smallpox, as to whether absolute destruction by fire would not be the preferable method to pursue. Special hospitals should be erected for the treatment and care of individuals afflicted with this malady, and with a view to preventing mortality the disease should not be considered as a light or trivial one, but the danger of pneumonic or other complications when prevalent among adults should be borne in mind. Especially is it essential that patients should not be returned to duty too early or until they have fully recovered their strength, and in the interest of others it is urgently recommended that they be not returned to duty until the desquamative process is entirely completed and the patient should be, as in the case of smallpox, subjected to an antiseptic bath, with particular attention to the scalp, beard and other regions likely to harbor infection.

With this brief sketch of the three diseases—typhoid fever, smallpox, and measles—which it was intended would furnish the subject of this paper, the discussion, so far as the writer is concerned, can now be brought to a close. I am confident, and fully appreciate, that I have brought to your attention nothing which was not well known to one and all of you, but my endeavor has been to accentuate in all of these diseases the necessity for early recognition and accurate diag-

nosis, which I place above all others in the rank of preventive measures.

What has been said of the three diseases in question applies equally well to other diseases of a communicable nature, such as typhus fever, diphtheria, dengue, and to some extent also to yellow fever, but unfortunately not to malaria.

The diseases commonly known as communicable should be early and accurately diagnosed, the patients isolated, articles exposed to the infection, disinfected or destroyed, and the certainty should exist that the individual is incapable of conveying infection of the disease from which he has suffered before being returned to duty.

In the case of diphtheria it is an open question, with the weight of evidence on the affirmative side, as to whether the tent mates of an individual who has developed diphtheria should not be immunized with doses of diphtheria antitoxin. This certainly would be an excellent method of limiting the spread among those directly exposed.

To consider the question of other epidemic communicable diseases, such as plague, cholera, etc., while subjects full of interest, would extend this paper to a length which would be unjustifiable in view of the limited time and the consideration these matters will receive from others who will have the privilege of addressing you.

I regret that I have nothing new, nothing strange, to communicate, but if anything which I have said will reduce by so much as one case, the disability, suffering and mortality consequent upon communicable diseases in future campaigns and at future times, I will need no apology for having consumed your time and will have been more than abundantly repaid for such effort as has been expended in the preparation of the very incomplete review which I have had the honor of bringing to your consideration.

STRICTURE OF URETHRA, ORGANIC: URINARY FISTULA: CYSTITIS, AND IRRITATIVE CANCER OF SCROTUM, INVOLVING TESTICLES AND URETHRA. RECOVERY.

BY HENRY W. SAWTELLE, M.D.,

SURGEON U.S. PUBLIC HEALTH AND MARINE HOSPITAL SERVICE.

THOUGH strictures of the urethra are quite frequent, particularly among our seamen, a report of the case herewith submitted presents unusual complications which may be of interest to those especially interested in genito-urinary surgery.

The subject of this report was admitted to the U.S. Marine Hospital, Chicago, June 19, 1898. The patient is a white, aged 52 years, and a native of Wisconsin. Occupation, Marine engineer. Family history good, and his general health has always been excellent barring the present lesion.

He states that he has had a stricture of the urethra for twenty-three years, that internal urethrotomy was performed in 1893, after which he passed a sound himself occasionally, also that he made a false passage while passing a sound four days previous to admission.

When admitted there was a small opening, about 2 c.m. in diameter, which was gangrenous, at the middle portion of the scrotum, through which urine escaped at each urination. Upon examination a stricture of the urethra was found at the membranous portion, and sounds were passed with some difficulty. Hot bichloride dressings were applied to the scrotum, and a silk elastic catheter retained in the urethra. The patient improved rapidly, the fistula closed, and he was discharged July 21, 1898, feeling well and able to resume his duties on board ship.

He was readmitted Nov. 30, 1901, and stated that after leaving the hospital in 1898, he had not been under treatment

and had experienced no difficulty in passing urine until within the past few months, since which time he has noticed a slight dribbling of water through the scrotum at former sight of fistulous opening.

On admission the patient appeared to be well nourished, though he presented a muddy complexion. The scrotum was greatly enlarged and two openings were found at its lower surface connected with each other and extending into the urethra just anterior to its membranous portion. A stricture was found about 3 cm. from the meatus, and one involving the membranous and prostatic portions of the urethra.

Dec. 2, 1901. Under chloroform anaesthesia the sinus connecting the openings was laid open, the parts curetted, and firmly packed to control the venous hemorrhage which was considerable. The cystitis which was present at this time was treated by irrigation of the bladder with permanganate of potash, 1:10,000. Sounds were passed up to 25 F. and a full sized silk elastic catheter was retained in the urethra.

The report of a microscopical examination of the growth made by Passed Assistant Surgeon Geddings at the Hygienic Laboratory of the service, Dec. 27, 1901, states that while the tissue examined was not considered a typical epithelioma there was a proliferation of the stratum granulosum into the corium, and "the somewhat atypical appearance was probably due to the slow growth or short duration of the condition."

Jan. 5, 1902. It was decided to remove the entire scrotum, testicles and penis. This was done by the Paquelin cautery after ligation of the spermatic cords high up. Hemorrhage was easily controlled, and the patient experienced no profound shock. A rubber catheter was retained in the urethra for two weeks.

It should be noted that the patient suffered considerable mental disturbance for a few days after the operation on account of the loss of his organs.

Beginning three weeks after the operation numerous small skin grafts were planted on the granulating surface at

different times. Some of these held and aided somewhat in the healing process.

Feb. 15, 1902. The inguinal wounds over the cord stumps have not healed and under chloroform anaesthesia they were enlarged by incision, and a ligature removed from each and two small superficial glands excised from the left groin. One of these was the size of a hazel nut and contained pus. A section made from it showed a typical small round celled sacroma. During the next two months the wound was exposed to the rays of the sun for fifteen minutes each morning when possible, and this appeared to aid materially in the healing process.



Site of the Lesion after Extirpation of Entire Scrotum,
Testicless and Penis.

March 15, 1902. The primary wound is healing slowly, but those in the groins remain stationary and are being stimulated with silver nitrate 1:200, and zinc chloride 1:20.

March 24, 1902. The entire space above the urethral opening has healed over, but those at the site of cord stumps have not closed. The left side especially has had periodical relapses, the stump of the cord each time becoming enlarged and very sensitive on pressure.

April 3, 1902. A small ulcer the size of a five cent piece has formed in the scar tissue above the urethra. The wound

below has increased in size; wounds of groin discharging but little. Aristol and dry dressings employed with success.

April 14, 1902. The small ulcer referred to above the urethra has again closed, the one below is improving. Wounds of groin are discharging very little, and filling up gradually.

April 28, 1902. The wound below the urethra and that in the right groin have both healed over.

May 6, 1902. All of the wounds have healed, that in the left groin being the last, and the patient was to-day discharged recovered, feeling entirely well, weight 180 pounds; control of urination perfect. All of the lymphatic glands are apparently normal in size and there is no indication of a systemic invasion.

In a letter to the author dated August 25, 1902, the patient reported that he had been on duty as Chief Engineer of the S. S. "Wilhelm" since July 16, 1902, and that he was "feeling like a new man."

I am indebted to my friend Dr. A. J. Ochsner, Assistant Surgeons Billings and Fricks for valuable assistance in the treatment of the case.

The site of the lesion, including mouth of urethra is shown in the accompanying photograph.



THE PUBLIC HEALTH AND MARINE HOSPITAL
SERVICE OF THE UNITED STATES.

BY BENJAMIN S. WARREN, M. D.

ASSISTANT SURGEON, U. S. PUBLIC HEALTH AND MARINE
HOSPITAL SERVICE.

WHILE the Marine Hospital Service was founded in 1798 very little was known of it outside of the Department until its reorganization in 1871. Before that time it consisted mainly of independent hospitals built as necessity arose and under charge of a surgeon appointed by the Secretary of the Treasury for service at that place and not subject to change of stations.

In 1871 the service was reorganized and all the hospitals placed under the charge of a Supervising Surgeon with office in Washington. Later this officer was called Supervising Surgeon General, and under the new regime the relief was extended and the service became better and more favorably known, and quarantine and Public Health functions began to be added to its duties. The number of officers were increased and entrance and promotion examinations required, and the officers were made subject to change of station.

In 1889 a law was passed requiring the officers to be appointed and commissioned by the President by and with the advice and consent of the Senate, and the Service assumed its present status.

On July 1, 1902, Congress passed an Act to increase the efficiency and change the name of the Marine Hospital Service. Under this Act the title of the Service was changed to that of the Public Health and Marine Hospital Service of the United States. This measure materially broadens the scope of the Service, giving it the name as well as the functions of the Public Health Ser-

vice, and provides for a conference of quarantine and state health authorities with the Surgeon-General relative to public health matters. Under the provisions of this Act the corps of the Public Health and Marine Hospital Service consists of commissioned and non-commissioned officers. The commissioned officers are the Surgeon-General, Assistant Surgeons-General, Surgeons, Pass-



Headquarters of the Public Health and Marine Hospital Service of the United States in Washington.

ed Assistant Surgeons and Assistant Surgeons, and except for the Surgeon-General have the same pay and allowances as officers of similar grades in the Army. Admission to the corps is only made after a physical, academic, and professional examination by a board of commissioned officers of the corps. These examinations are similar to those of the Army and Navy, and the standard is the same, a

minimum of 80% as a general average being required. The non-commissioned officers are Acting Assistant Surgeon, Sanitary Inspector, Interne, and Pharmacist. The Acting Assistant Sur-



Camp Jenner — Smallpox Hospital.

geon, unless a temporary appointment, or salary of \$300.00 or less per annum, is appointed by the Secretary upon the certification of the Civil Service Commission and recommendation of the Sur-



United States Marine Hospital, Key West, Florida. (Front View.)

geon-General; in the other instances, if the salary is \$300 or less, or if the appointment is temporary, it is made by the Secretary on recommendation of the Surgeon-General. Internes are appointed by the Secretary on the recommendation of the Surgeon-

General after examination by the Medical Officer in Command of the station at which they are to serve, and must be graduates in medicine. Pharmacists are appointed by the Secretary on the recommendation of the Surgeon-General after a successful examination under the rules prescribed by the Civil Service Commission.

The functions of the Public Health and Marine Hospital Service may now be considered three-fold:—the Marine Hospitals treating 58,000 sailors annually; the quarantine and other public health duties; and scientific investigations in the Hygienic Laboratory provided by the last Congress for "the investigation of



United States Quarantine Station Hospital, Ship Island, Mississippi.

infectious and contagious diseases and matters pertaining to the public health." These functions are so intimately interwoven that they could not be separated without injury to all. The officers, by the system of change of station, are trained in all the duties of quarantine and sanitation. At the same time, the experience afforded by their detail to the hospitals maintains their professional excellence. The advantage in having a corps trained in medicine and surgery and sanitation is obvious as compared with one trained in only one of these branches of medical knowledge.

As a Marine Hospital Service it owns and operates 21 marine hospitals, operates 2 additional hospitals under lease, and main-

tains 115 relief stations where hospital or dispensary treatment is furnished. During the fiscal year ending June 30, 1902, over 56,000 sick and disabled seamen of the merchant marine were treated at the various stations. These relief stations are located



United States Marine Hospital, Evansville, Indiana. (Front View.)

at all the important ports of the United States, including new stations in Hawaii and Porto Rico. Other branches of the government service received aid from the Marine Hospital Service as follows:



South Atlantic Quarantine, Blackbeard Island, Georgia—Disinfecting Wharves.
North End.

1. Life Saving Service, in the physical examination of surfmen and the examination of claims of surfmen for the benefits provided by the Act of May 4, 1882.
2. Revenue Cutter Service, in the examination of applicants for enlistment, promotion or retirement.
3. Steamboat Inspection Service, in the examination of applicants for pilots licenses.

4. Coast Survey & Light House Establishment in the examination of applicants for enlistment.

5. Immigration Service, in the medical inspection of immigrants. During the last fiscal year over 472,000 immigrants were examined by officers of the service.

As a Public Health Service it operates all the national quarantine stations; when requested by the proper authorities, assists in the management of epidemics; publishes the Public Health Reports; and maintains a Hygienic laboratory.

The Service, at the close of the fiscal year, owned 19 complete maritime quarantine stations, and 18 other stations where the inspection of vessels was conducted. During the fiscal year 1902 all the Florida quarantine stations have been transferred to the Service; of these 6 are equipped for disinfection and 5 for inspection.

The Service during the year conducted the maritime quarantines in Porto Rico, Hawaii and the Philippines.

To further aid the quarantine service and prevent the introduction of contagious or infectious diseases into the United States, whenever occasion requires, officers are detailed to duty in foreign countries to watch the progress of epidemics, and inspect vessels bound for the United States ports, and report to the Surgeon-General facts, or information, that may be of use to the Quarantine authorities here whether national, state, or municipal. For this purpose, medical officers have been on duty during the last fiscal year at the ports of London, Liverpool, Paris, Berlin, Naples, Quebec, Kobe, Yokohama, Rio Janeiro, Belize, Livingston, Puerto Cortez, La Ceiba, Bluefields, Port Limon, Bocas del Toro, Vera Cruz, Progreso and Tampico.

Assistance in the control of epidemics was furnished¹ during the fiscal year in the detail of medical officers of the Service to make investigations and assist the local authorities in putting into operation measures for the suppression of smallpox in the States of Alabama, Georgia, Colorado, West Virginia, and the territory of Alaska.

To aid in the suppression of plague in San Francisco, by agreement, the work of inspection, isolation and disinfection in

Chinatown, San Francisco, was carried on by the State and City authorities under the advice and direction of officers of the Service.

The Public Health Reports, which are issued weekly, published during the year sanitary reports from 1435 cities and towns of the United States and 110 of the principal foreign cities. In addition to publishing the mortality tables and tables of epidemic diseases, reports are published from the officers of the Service and consular officers relative to the health conditions of the countries in which they are stationed.

The Hygienic Laboratory during the year made 100,000 doses of Haffkine prophylactic which were distributed to the Philippine Islands, Hawaii and Pacific coast. Experiments were made with the plague bacillus to determine its viability under all possible conditions, and results were published in a bulletin. Bulletins were also published on the results of experiments made to determine the value of sulphur dioxide and formaldehyd gas as disinfecting agents. The results of all important work done in the Laboratory are published in the Bulletins. These, of course, appear at irregular intervals, and are mailed to Medical Colleges, Medical Libraries, other laboratories and persons interested in such matters. The laboratory has outgrown its present quarters, and the last Congress appropriated a site and \$32,000.00 for a building, stating in the bill that it should be used in investigating contagious and infectious diseases and other matters relating to public health.

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Surgeon General *Walter Wyman*, Public Health and Marine Hospital Service.

Editorial Department.

SURGEON GENERAL WALTER WYMAN, PUBLIC
HEALTH AND MARINE HOSPITAL SERVICE.

THE reorganization of the service, originally established for the care of the sick of the merchant marine, and its extension into the Public Health and Marine Hospital Service, is largely the outcome of the superb organizing capacity of its head.—Surgeon General Walter Wyman. Dr. Wyman was born in St. Louis, Mo., August 14, 1848, and received his early education at the City University from which he was graduated in 1866. In 1870, he was graduated A. B., from Amherst College, from which he also received the degree of A. M. in cursu.

His professional studies began at the St. Louis Medical College, which conferred the doctorate in medicine upon him in 1873, after which he served a couple of years in the hospitals of his native city, completing his preparation for his life work.

In the autumn of 1876, he was appointed assistant surgeon in the Marine Hospital Service, attaining the rank of Surgeon the following year, and serving successively at St. Louis, Cincinnati, Baltimore and New York, after which he was placed in charge of the Purveying and Quarantine Divisions of the Surgeon General's Office in Washington, also having charge of the publication of Sanitary Reports and Statistics. Later, these duties were divided and he was relieved from all but the Quarantine work,—a duty which he continued to perform until his appointment as Surgeon General in 1891.

General Wyman has given special attention to physical conditions affecting seamen of the merchant marine, and has been instrumental in securing the enactment of most valuable legislation for their benefit,—notably one act for the relief of deck hands

on western rivers. He brought before the public the cruelties inflicted upon the crews of oyster vessels in Chesapeake Bay, and established hospitals for the treatment of their sick and injured. While Surgeon in charge of the New York Marine Hospital in 1885, he established at that station, with the consent of Surgeon General Hamilton, a Hygienic Laboratory, which was later moved to Washington, and for which Congress has lately appropriated funds for a new building,—defining its purposes to be the investigation of infectious and contagious diseases and other matters relating to the public health.

He was in charge of the government measures to ward off cholera in 1893 and is still by law charged with the administration of national quarantine stations. He established and is chairman of the Yellow Fever Institute of the Public Health and Marine Hospital Service, and originated and established the sanatorium for tuberculous sailors at Fort Stanton, New Mexico. Under his direction are twenty-two Marine Hospitals and a large number of Relief Stations, giving relief annually to more than fifty thousand sailors of the merchant marine. He also has charge of national quarantines in Porto Rico, Hawaii, the Philippines and Alaska, together with the marine hospitals located there. He is especially interested in international sanitation of cities, particularly seaports, with a view to rendering rigid quarantine unnecessary, and is the author of a plan for an international agreement by the republics of the western hemisphere to bring this about.

The work of sanitary improvement, to which Dr. Wyman's career has been devoted, has involved many valuable contributions to public health literature, which have appeared in the form of professional and popular journal articles, addresses and communications, in addition to the massive series of Reports issued under his supervision during the past twelve years.

He has not permitted his official administrative duties to distract his attention from professional work, but has constantly kept up his relations with the profession. He early became a member of the Association of Military Surgeons of the United States, and is now its Second Vice President. At the recent

meeting of the American Public Health Association he was elected to the presidency. He is an active member of the American Medical Association, the National Geographical Society, the Climatological Society, and the Washington Academy of Sciences. In 1897 the Western University of Pennsylvania recognized his work with the honorary degree of LL.D., and upon the organization of the Washington Postgraduate Medical School, he became Professor in the Department of Preventive Medicine.

Surgeon General Wyman is still in his early prime, and the future years of his career promise to add largely to the record of the past and materially increase the distinction which already crowns so successful and useful a life. His remarkable executive ability, reinforced by a rare degree of tact, discretion and judgment, sustained by unusual professional acquirements and enthusiasm, all bound together by a bond of patriotic devotion,—must needs, hereafter as heretofore, continue to work for the welfare of the public and the health of the nation.

TYPHOID IN THE BRITISH SERVICE.

IN view of the subject of the Enno Sander prize essay competition for the present year, especial interest attaches to the statements in that direction made by Col. Elliston in his presidential address before the Army and Navy section of the last meeting of the British Medical Association (*Brit. Med. Jour.*). He noted the fact that all through the South African war one could hardly read the casualty lists without being struck with the appalling loss of life from enteric fever; the losses in the field were small compared with it, and sanitarians cannot help thinking that much of it was due to preventable causes. In civil life he had been a medical officer of health for twenty-eight years, and the time was, when municipal sanitary work was obstructed on account of the expense, but through the efforts of health officers public opinion has changed all that, and at the present day, when typhoid fever breaks out in a district, the municipal authorities hold the medical officer responsible, and expect him to find

out the cause and suggest measures for stamping out the disease regardless of cost. In military life this does not appear to be the case. A general who gets a large portion of his force down with enteric fever, through want of ordinary precautions in guarding the purity of the water supply and preserving the cleanliness of his camps, does not get censured, but the sanitary officer whose advice was not taken is pronounced incompetent and indirectly blamed. No doubt the sanitary officer in war must constantly be advising things distasteful to the combatants; this is possibly why the post was abolished at the commencement of the war. The combatants, however, should bear in mind that by safeguarding their water supplies, attending to the sanitation of camps, and preventing infection of troops on the march, they are not only reducing the amount of sickness, but are adding to the efficiency of the field forces as a fighting machine. All this shows the necessity for the principal medical officer and sanitary officer of an army in the field being in close touch with the general officer commanding, and not kept at the base, as has been too often the case.

Much, he continued, has been written and said of late of the formation of a Royal Water Corps, equipped with a boiling apparatus, which shall supply the soldier on the march with a sufficient quantity of "safe water," so that his water bottle can be filled as often as may be required. The War Office has recently announced its intention to put into execution a scheme for carrying out this important piece of sanitary reform, and there is little doubt that if it receives the help and approval of commanding officers, it will have an important effect upon the health of armies in the field. He concludes by noting the fact that enteric fever is not entirely a waterborne disease,—there are many other channels through which infection may be received in the field. In his own district, where the water supply is above suspicion, troublesome outbreaks of enteric fever periodically occur, and in his experience such channels as personal infection, through air, polluted soil, or ground air, food, dust, flies, bedding, and tents must be strictly guarded by sanitary officers with armies in the field.

Reviews of Books.

DISINFECTION AND DISINFECTANTS.*

DISINFECTION, with the great development of preventive medicine, is rapidly assuming an importance in the work of the practitioner equal to, if not exceeding that of any other division of his varied functions. The work of Dr. Rosenau will prove to be a timely instrument not only for the especial class for whose use he primarily designed it, but for every physician. He takes up the subject in six chapters in which he discusses disinfection by physical agents; by gases; by chemical solutions; and by insecticides in case of insect-borne diseases; disinfection of houses, ships and objects; and disinfection for the communicable diseases. Under the first division he takes up the agency of sunlight, electricity, burning, dry heat, boiling and steam. The gaseous disinfectants treated are formaldehyd, sulphur dioxid, hydrocyanic acid, chlorin, oxygen and ozone. In connection with chemical disinfectants, he remarks that "the undeserved reputation of many so-called chemical disinfectants depends more upon their vile odor or judicious advertising than upon actual efficiency." The notion that disguise of a stink by a worse stink is disinfection, is an error, altogether too prevalent among the laity, which extends itself even among many of the less progressive of the profession. He ranks soap as a chemical disinfectant although he hardly lays sufficient stress upon the desirability of its use particularly as a deodorant in case of sinks, closed-stools and water closets,—places which are particularly subject on the part of the laity to the application of malodorous

**Disinfection and Disinfectants. A Practical Guide for Sanitarians, Health and Quarantine Officers.* By M. J. ROSENAU, M.D., P.H. & M.H.S. 8 vo: pp. xii, 353: 96 illustrations: Philadelphia, P. Blakiston's Son & Co., 1902.

disinfectants. He admits the transmission of typhoid by flies and of yellow fever by the *Stegomyia fasciata*. The book is well up to date in all respects and a most valuable contribution to medical literature.

THE EARTH AND CONTAGIA.*

THE greater portion of this book comprises the Milroy Lectures delivered by its distinguished author at the Royal College of Physicians in 1899. Like his *Rural Hygiene* and *The Dwelling-House*, the present work is eminently practical. He advocates earth disposal of night soil and in a chapter on "Sanitation in Holland" describes fully the methods employed along this line in the Netherlands. Another interesting example is afforded by Carrington Moss which is being reclaimed by the city of Manchester through the utilization of the organic refuse of the city. In a chapter upon the Sanitation of Camps he makes practical application of his belief, advocating the disposal of excreta in a narrow and shallow trench in which it is to be immediately covered. This will produce a fertilized section which, he suggests, could be well utilized for raising kitchen vegetables. By carrying this plan to its extreme, the plague of flies can be practically avoided and the consequent spread of enteric fever largely obviated. He observes that this was the method employed by the children of Israel upon their long march from Egypt to the Promised Land, according to the directions of Holy Writ:[†]

"Thou shalt have a place also without the camp, whither thou shalt go forth abroad.

"And thou shalt have a paddle upon thy weapon; and it shall be, when thou wilt ease thyself [sittest down] abroad, thou shalt dig therewith, and shalt turn back and cover that which cometh from thee."

He is no friend of the use of chemical disinfectants in the management of refuse, considering them expensive, generally

**The Earth in Relation to the Preservation and Destruction of Contagia. Together with Other Papers on Sanitation.* By GEORGE VIVIAN POORE, M.D.(LOND.), F.R.C.P. 12mo: pp. 257; London; Longmans, Green & Co., 1902.

[†]Deuteronomy, xxiii, 12-13.

evil-smelling, often poisonous, and leading to an increase of material to be transported. The soil he believes to be quite capable, with proper management, of turning all organic refuse into "soil,"—as his experiments have abundantly proven. He has also demonstrated that, from the point of view of the innocuous transformation of organic refuse into "soil," deep burial is a mistake, a fact which is equally true of dead animals and excreta.

NURSING.*

THIS little book has been extensively used in training schools for female nurses and has admirably fulfilled its function of supplying the theoretical knowledge demanded by student nurses. The third edition amply sustains the reputation won by previous issues.

MEDICAL JURISPRUDENCE.†

REESE found a vacant niche in medical literature and filled it well. The comprehensive treatises on the law of medicine, up to the appearance of his book, were too bulky, over-prolix, and more expensive than the ordinary student of medicine could manage. The few briefer works were defective, deficient and one-sided. Dr. Reese gave the medical profession a well-balanced epitome of the subject, which has been of great service to an army of medical students from whose education legal medicine would without it have been wanting. The work is designed and adapted for the use of the student of medicine,—there are numerous features missing which are neces-

**A Text-Book of Nursing. For the Use of Training Schools, Families and Private Students.* By CLARA WEEKS-SHAW. Third edition, thoroughly Revised and Enlarged. 12mo; pp. ix, 397; 42 illustrations. New York, D. Appleton & Co., 1902.

†*Text book of Medical Jurisprudence and Toxicology.* By JOHN J. REESE, M. D. Sixth Edition. Revised by HENRY LEFFMAN, A. M., M. D. 8 vo; pp. 660. Philadelphia, P. Blakiston's Son & Co., 1902.

sary in a textbook on medical evidence for the use of the law student or attorney. The manual for the latter has yet to be published.

About equally balanced between toxicology on the one hand and the remaining branches of legal medicine on the other. Reese's work touches upon all the components of the subject succinctly and intelligently. Like most works of the sort it is not full on the subject of expert evidence and the laws of medical practice. These are features, which become of vital importance to the unaccustomed medical witness and are deserving of more extended treatment than has usually been given them. Professor Leffman has exercised his editorial function with discretion and judgement and kept the work well up to date. He dwells upon the benefit of free washing out of the stomach and notes the employment of alcohol in phenol poisoning, but abandons the long current belief in the antidotal value of atropin in morphin poisoning.



Constitution and By-Laws.

Revised June 5, 1902.

PREAMBLE.

The Military Surgeons of the United States, in order to promote and improve the science of Military Surgery, have associated themselves together and adopted the following Constitution and By-Laws:

CONSTITUTION.

ARTICLE I.

NAME.

The organization shall be known as "THE ASSOCIATION OF MILITARY SURGEONS OF THE UNITED STATES."

ARTICLE II.

MEMBERS.

SECTION 1. There shall be Active, Life, Associate, Corresponding and Honorary Members.

SECTION 2. Active and Life members only are eligible to office or entitled to vote.

ACTIVE MEMBERS.

SECTION 3. Active membership is limited to commissioned medical officers of—

1. The United States Army;
2. The United States Navy;
3. The United States Public Health & Marine Hospital Service;
4. The United States Volunteers;
5. The National Guard and other state troops; and
6. Contract or acting assistant surgeons of the United States Army, Navy and Public Health & Marine Hospital Service.

Active members may retain their membership, should they be honorably discharged from the service in which they have been commissioned.

LIFE MEMBERS.

SECTION 4. Life membership and exemption from the payment of annual dues is conferred upon—

1. The first honorable mention Prize Essayists of the Association, and
2. Any active member upon the payment of fifty dollars at one time.

ASSOCIATE MEMBERS.

SECTION 5. Associate membership is open to—

1. Ex-medical officers and
2. Other officers of the aforementioned services,
3. Ex-medical officers of the Confederate Army and Navy, and
4. Medical officers of foreign services.

CORRESPONDING MEMBERS.

SECTION 6. Corresponding membership is open to military surgeons, not resident in the United States, but prominent in military medicine, surgery, and hygiene.

HONORARY MEMBERS.

SECTION 7. The President of the United States, the Secretaries of War, the Navy, and the Treasury, the Commanding General of the Army, and the Admiral of the Navy for the time being, shall be honorary members. Other persons who have rendered distinguished service to the Association, or who have otherwise attained distinction deserving of recognition by the Association, are eligible to honorary membership.

ARTICLE III.

OFFICERS AND STANDING COMMITTEES.

OFFICERS.

SECTION 1. The officers shall be a President, two Vice-Presidents, a Secretary and a Treasurer, who shall hold their respective offices until their successors are elected and qualified.

STANDING COMMITTEES.

SECTION 2. There shall be the following Standing Committees:

An Executive Committee, to consist of the officers and ex-presidents, and five (5) members.

A Publication Committee, to consist of three (3) members, one of whom shall be the Secretary as *ex-officio* Chairman.

A Literary Committee, to consist of seven (7) members,—four (4) members from the National Guard, State Troops or Militia, and one (1) each from the Army, Navy and the Public Health & Marine Hospital Service.

A Nominating Committee, based upon a representative or one vote for each State, Territory, the Army, the Navy and the Public Health & Marine Hospital Service, and for every additional ten (10) members or major

fraction thereof an extra representative or vote; said vote or votes to be cast by a member or members, present from each State, Territory, Army, Navy and Public Health & Marine Hospital Service, to be designated by the members present from each State, Territory, Army, Navy and Public Health & Marine Hospital Service at the time of meeting.

ARTICLE IV.

QUORUM.

Thirty-five (35) members shall constitute a quorum for the transaction of business, but a less number may adjourn.

ARTICLE V.

AMENDMENTS.

All amendments to this Constitution and By-Laws shall be proposed in writing at one annual meeting, and voted on at the next. A three-fourths vote of all the members present at the annual meeting shall be necessary for adoption.

BY-LAWS.

ARTICLE I.

ELECTION TO MEMBERSHIP.

SECTION 1. Election to active or associate membership shall be by the Executive Committee, to whom the Secretary shall refer all applications, together with such credentials as may be presented.

SECTION 2. Election to honorary or corresponding membership shall be by a two-thirds vote of the Association, after the unanimous recommendation of the Executive Committee.

ARTICLE II.

EXPULSION FROM MEMBERSHIP.

Any member who may be dismissed from the service for conduct unbecoming an officer and a gentleman shall be expelled and debarred from any further rights or privileges when proper proof has been furnished the Secretary.

ARTICLE III.

MEETINGS.

The Association shall meet annually, the time and place to be fixed at each meeting for the one ensuing. Special meetings may be called by the President at any time. At the annual meeting the President, Vice-Presidents, and the Treasurer shall be elected for the term of one year, the standing committees appointed, and the annual reports received.

ARTICLE IV.

DUES AND DELINQUENTS.

The dues to be paid by Active and Associate members shall be three dollars (\$3.00) with the application for membership, and three dollars (\$3.00) per annum thereafter, due on January 1 of each year.

Delinquents in the payment of dues will not be entitled to the Journal or other publications of the Association. Delinquency for two years shall terminate membership, after due notice by the Treasurer.

No one formerly a member of the Association, who shall have allowed his membership to lapse by non-payment of dues, shall be reinstated before paying all arrears.

Honorary, Corresponding and Life members shall be exempt from the payment of dues.

ARTICLE V.

DUTIES OF OFFICERS.

THE PRESIDENT.

SECTION 1. The President shall preside at all meetings, appoint all committees, unless otherwise provided for, approve all proper bills, and perform such other duties as are usually incumbent upon such an officer.

THE VICE-PRESIDENTS.

SECTION 2. The Vice-Presidents in order of seniority, shall perform the duties of President in the absence or inability of that officer.

THE SECRETARY.

SECTION 3. The Secretary shall keep the records and archives of the Association; receive all applications for membership and refer them to the executive committee; notify the Treasurer of the election of active and associate members; issue certificates of membership to active, associate, corresponding and honorary members on election, and to life members when advised by the Treasurer that the necessary fee has been paid; and shall hold office until his tenure is terminated by resignation or death, or by the election of his successor after due and timely notice.

He shall be a member and *ex officio* chairman of the Publication Committee.

He shall appoint an Assistant Secretary each year, and shall present an annual report.

THE TREASURER.

SECTION 4. The Treasurer shall receive all moneys due the Association, collect all assessments, and pay all bills which have been properly approved.

The accounts of the Treasurer shall be audited by a committee appointed for that purpose on or before the annual meeting. He shall present an annual report.

He shall execute such bond of \$2,000 as may be approved by the Executive Committee for the faithful performance of his duties, the Association to bear the cost of this insurance.

ARTICLE VI.

DUTIES OF COMMITTEES.

THE EXECUTIVE COMMITTEE.

SECTION 1. The Executive Committee shall perform the duties prescribed by the Constitution and By-Laws, and such other administrative or executive duties as may be referred to it, and for which provision has not otherwise been made. The President shall be *ex-officio* chairman.

THE PUBLICATION COMMITTEE.

SECTION 2. The Publication Committee shall have charge of the publications of the Association.

It shall determine what portions of the proceedings are of sufficient general interest to be printed, and decide upon the advisability of publishing the several papers, presented at the annual meetings, and such other matter as may be of value to the Association.

It shall prepare for publication, contract for printing, and see through the press all the publications of the Association; but all contracts for printing must first have the approval of the President and the Treasurer.

THE LITERARY COMMITTEE.

SECTION 3. The Literary Committee shall outline the literary work for the annual meeting in advance, making the necessary arrangements for the reading and discussion of papers.

The Chairman shall be responsible for the program for the ensuing meeting.

The Committee shall assist the Publication Committee in the prompt publication of the Proceedings.

THE NOMINATING COMMITTEE.

SECTION 4. The Nominating Committee shall, at the annual meeting, present a list of candidates for the various offices for the ensuing year.

The vote or votes, of the Nominating Committee shall be cast by a member or members present from each State or Territory, the Army, the Navy, and the Public Health & Marine Hospital Service.

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With this number, the Journal of the
Association of Military Surgeons of the
United States is changed from a Quarterly
to a Monthly.

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July, 1902

Bookplate

JOURNAL OF THE ASSOCIATION OF MILITARY SURGEONS OF THE UNITED STATES.

James Evelyn Pilcher,
EDITOR.



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1902.

Association of Military Surgeons OF THE UNITED STATES.



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The admission fee is Five Dollars, and there are no dues for the first year. The annual dues are the same and both include the subscription to the Journal. Applications for membership and for further information should be addressed to—

THE ASSOCIATION OF MILITARY SURGEONS, Carlisle, Pennsylvania.



Vol. XI, No. 2

August, 1902

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Vol. XI, No. 4

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OF THE ASSOCIATION OF
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SURGEONS
OF THE UNITED STATES.

James Evelyn Pilcher,
EDITOR.



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SURGEONS
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James Evelyn Pilcher,
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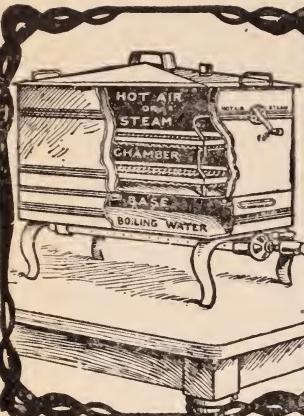
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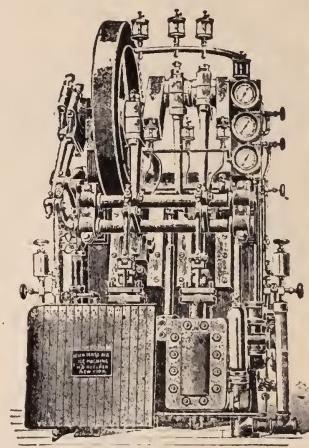
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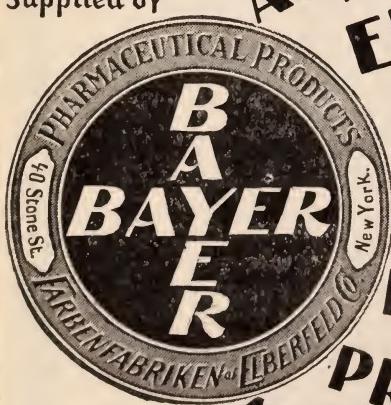
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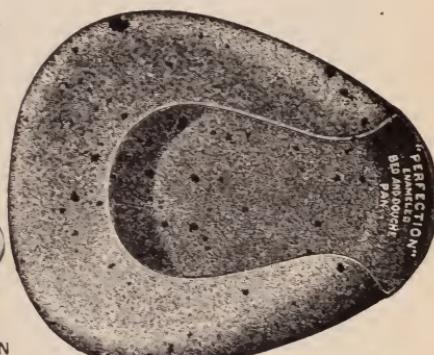
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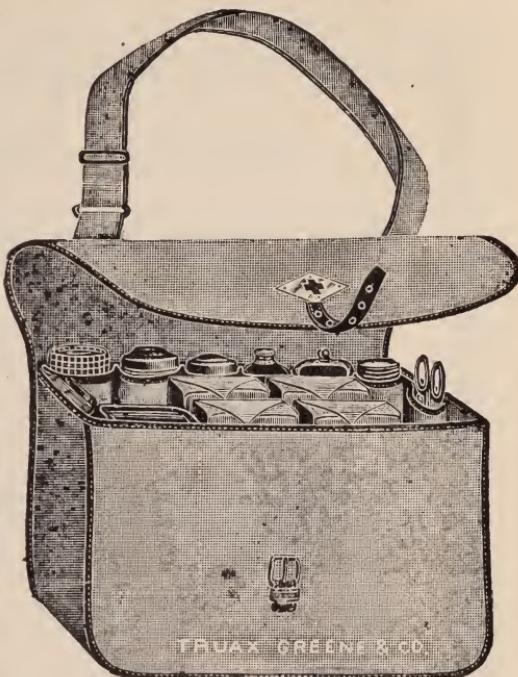
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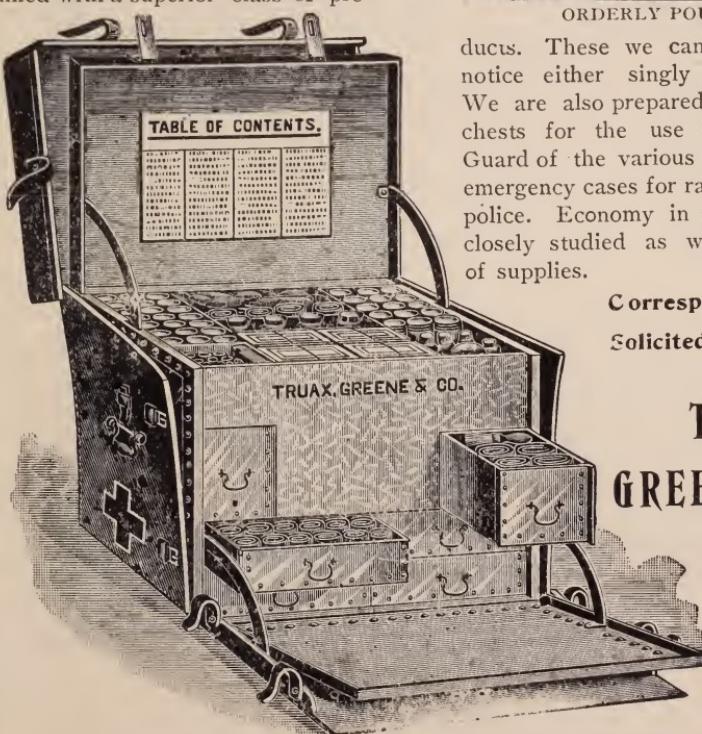
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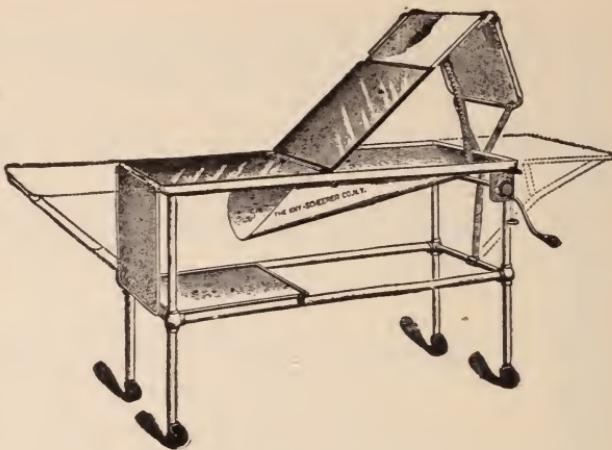
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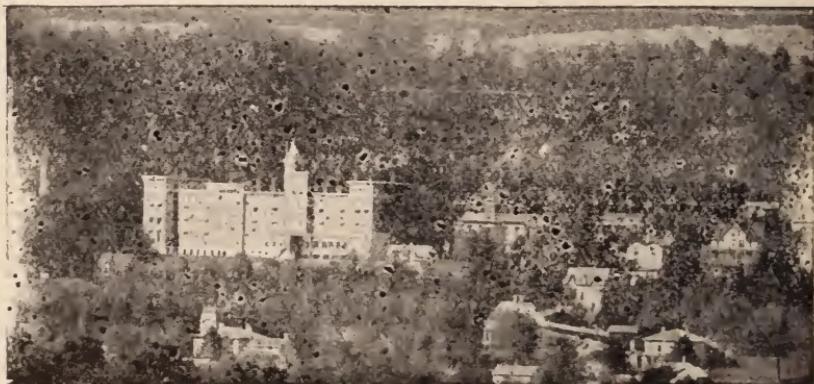
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The references are to the pages of this number of the Journal on which may be found the announcements of the firms, who are recommended in connection with the articles named.

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Special Notices.

THE ANTIIPHLOGISTINE ORIGINAL PACKAGE.

WE have to acknowledge the receipt, from the Denver Chemical Manufacturing Co., of a unique circular in the form of a pictorial package of antiphlogistine, which is not only an excellent imitation but a souvenir of real value with its neatly executed calendar for 1903 and its well put and brightly colored antiphlogistic maxims.

INVESTIGATIONS OF THE ACTION OF SUBLAMINE (ETHYLEDIAMINE-SULPHATE OF MERCURY) AS A DISINFECTANT.

DR. M. BLUMBERG describes in detail in the *Muechener Medicinische Wochenschrift*, the experiments reported at last year's Surgical Congress in Berlin, and announces the results obtained from practical applications of Sublamine.

He calls attention to the importance of selecting the mercurial salt having the greatest power of tissue penetration, which, as his experiments have demonstrated, is Sublamite. Furthermore, corrosive sublimate frequently causes eczemas of the skin; and exact experimentation has shown that the very slightest roughness, the most insignificant scaling of the skin, make an efficient redisinfection more and more difficult. As Schleich, Gottstein, Haegler and others have insisted, a good condition of the hands is the first desideratum for efficient sterilization; and Sublamine, even in very concentrated solutions, in which sublimate cannot be employed at all, does not attack the skin.

Sublamine has been used by Prof. Kroenig in his extensive operative work, in all his laparotomies and other operations, for the disinfection of the hands and skin, and the constant employment of Sublamine left the operator's hands in irreproachable condition. Prof. Kroenig authorized him to publish the following statement: "Prof. Kroenig uses Sublamine in his clinic for the disinfection of the operator's hands and the patient's skin in strengths of from 1:1000 to 1:500. Whenever the hands have been in contact with suspicious material, the concentration is increased to from 1:300 to 1:200; and no irritation of the hands has ever occurred. Besides this, the silk employed for sutures is boiled in a watery 1:300 Sublamine solution, as in the Kocher method."

SKIN GRAFTING WITH CALLUS SHAVINGS, IN BLOOD.

BY T. J. BIGGS, M. D.
STAMFORD, CONN.

MARY M.; age 60 years; Irish. Diagnosis. Ulcer of Leg. Patient admitted to Hospital, March 3, 1902. She had a large varicose ulcer situated over the tibia, about $3\frac{1}{2}$ by 2 inches. This condition had existed for nine years, and during that time in spite of all treatment employed had never entirely healed. It had been skin-grafted in the old way, three times

Continued on page xxviii.

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unsuccessfully. At the time of entering the hospital the patient suffered so severely from pain that at times she would cry out. She was put to bed, secretions regulated, the ulcer cleaned up by means of a dermal curette, and dressed for the first twenty-four hours with a Thiersch pack. On the morning of March 5th, after the surface had been thoroughly cleaned up, a bovinine-pure pack was applied and kept wet with the bovinine for twenty-four hours.

On the morning of the 7th, I determined to employ grafts secured from a callus on the small toe, in order to demonstrate the technique of this mode of skin-grafting to five visiting physicians. The mode of procedure was as follows: The callus was thoroughly scrubbed up, and the external layers scraped off. Then thin sections of the layers next to the true skin were obtained by means of a very keen razor. Nine of these were deposited on the ulcerous surface. Over these were laid strips of perforated rubber tissue, then strips of plain bi-sterilized gauze saturated in bovinine, and a bandage applied. The nurse was instructed to keep the dressings wet with bovinine pure. This dressing was removed on the 14th, and it was found, much to the delight and astonishment of the visiting physicians, that out of the nine grafts employed eight were firmly adherent and in a healthy growing condition. The ninth had become displaced and was removed. The wound was now dressed with bovinine pure; the dressings being kept wet, and changed once in twenty-four hours. Coincident with the local dressings, from the outset, the patient had been given a wine-glassful of bovinine in milk alternating with wine and beer every three hours. On March 24th, she was discharged cured, the entire surface having become covered with new healthy skin.

This experiment has been employed frequently enough by me to demonstrate that where the technique is carefully followed it will in the majority of cases yield the most gratifying results. A point of interest in this case and a usual one, is that from the day of the first dressing of the bovinine up to the time the patient was discharged, she was relieved of all pain.

MAINTENANCE OF ASEPSIS IN SURGICAL WORK.—TWO CASES OCCURRING IN THE PRACTICE OF

G. B. MURRAY, M. D.
GREENWICH, N. Y.

CASE No. 1.—I was called to attend a farm hand who took advantage of the pauses in the classic labor of loading a wagon with barnyard manure assisted by a companion, to quarrel with said companion, who, during the heat of the fracas, gently but firmly inserted the four tines of a manure fork reeking with filth about two inches into his glutei muscles. Interesting case, was it not?

Well, we gave the man a complete bath to begin with. Syringed out the deep punctured wounds with equal parts of Glyco-Thymoline and warm water, then with Peroxide of Hydrogen, then once more with the solution of Glyco-Thymoline, one part to two of water, syringing out the wounds once daily with same solution.

The man was not confined to his bed or even to his room for a single day.

The wounds are almost entirely healed at this writing and during the process of healing I have failed to detect sufficient pus to make a spot on a white hand-kerchief.

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Continued in the January Number.

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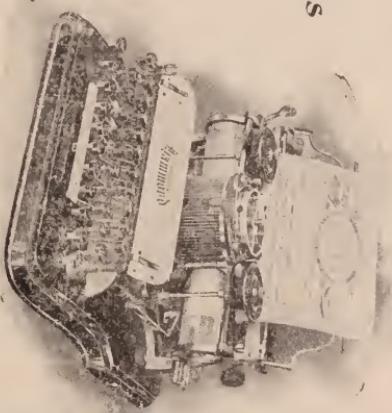
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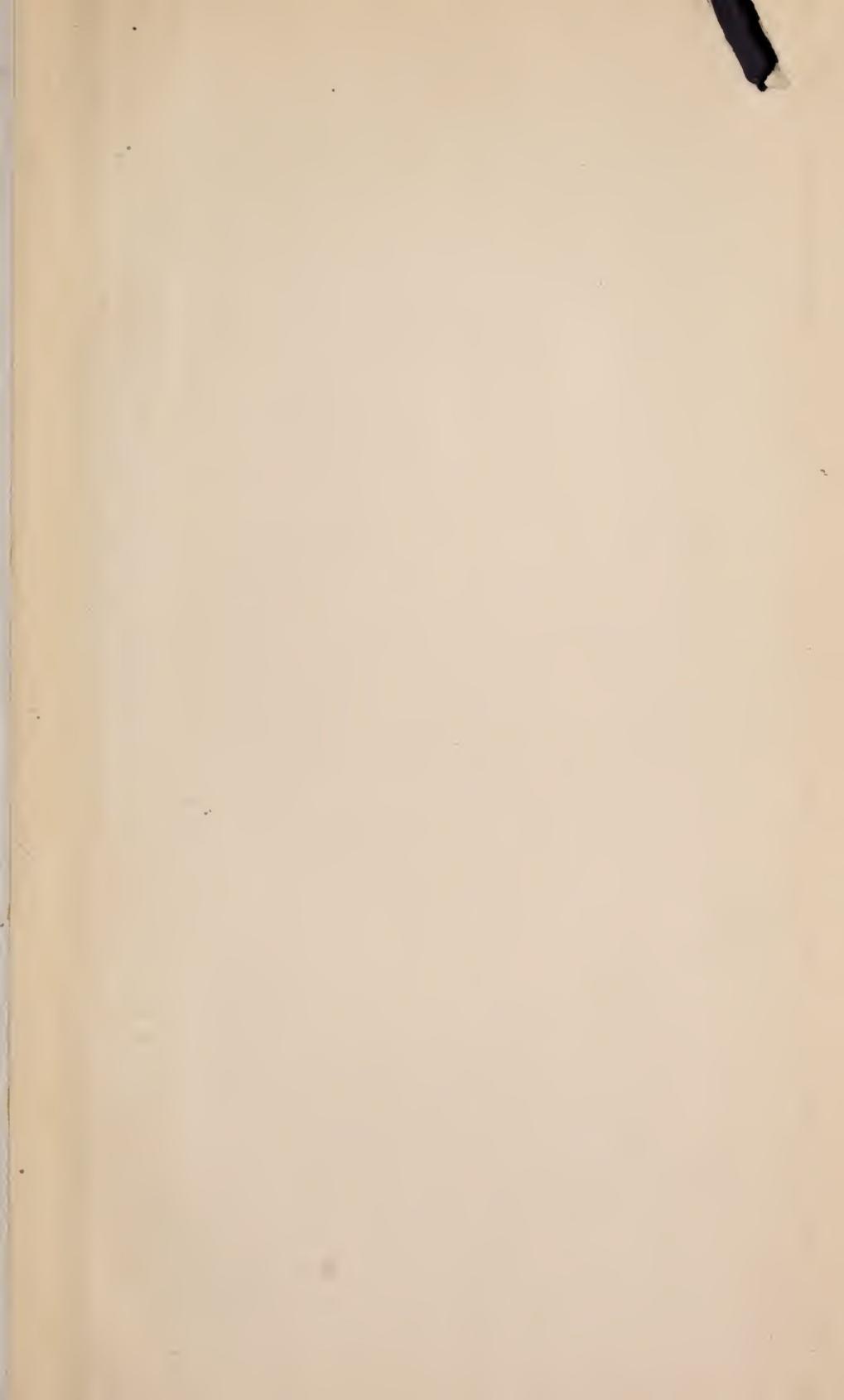
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